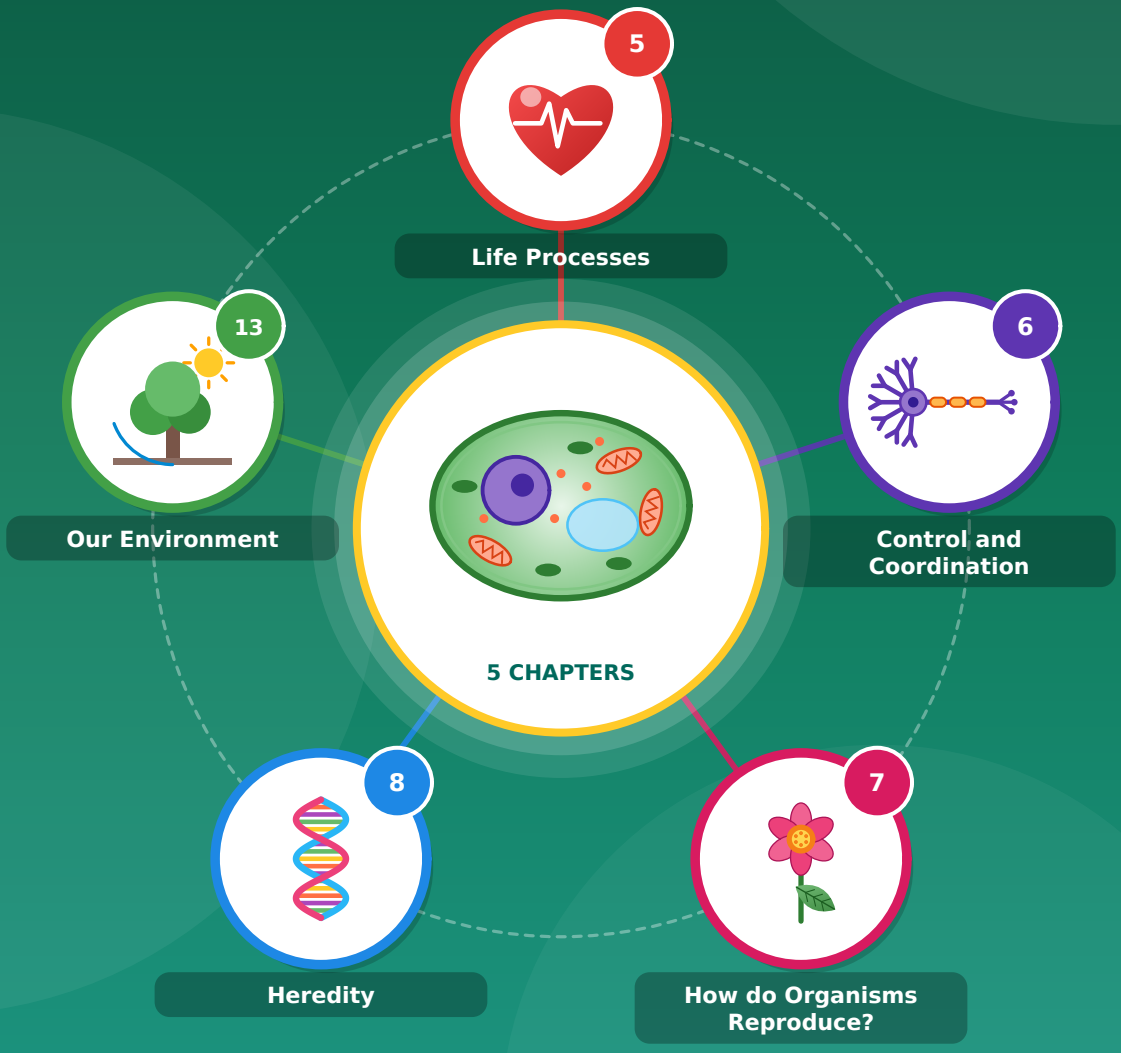
Science with Abhishek Sir

★ PYQ HUNT ★

BIOLOGY

Chapterwise Question Bank

CLASS 10 · CBSE SCIENCE (086) · SESSION 2026-27



Prepared by

Abhishek Das

TGT (Science)

sciencewithabhisheksir.in

62	761	5	★
Board papers checked	**Questions** picked	**Chapters** in this book	**Most asked** marked

A Message from the Creator

To my dear students of Class 10

Dear Students,

Every year the CBSE Board asks many questions from the same topics again and again. If you know these questions well, you already know a large part of your Science paper. This book is made to help you do exactly that.

I went through the Board question papers of past years, picked every Biology question that is still in your 2026-27 syllabus, and arranged them chapter by chapter, in the same order as your NCERT textbook. Questions that came many times are marked with stars, so you know what is asked the most.

All answers are written in the words of your NCERT book. Learn them in the same way. Draw the diagrams neatly and label them. Board examiners look for correct terms, neat diagrams and complete points.

Work a little every day. Ask your teacher when you are stuck. I am sure you will do well.

HOW TO USE THIS BOOK

1. **Read the chapter** in NCERT first
2. **Try the question** on your own
3. **Check the answer** in the green box
4. **Revise mistakes** and ★ questions

With best wishes,

29/8/24

Abhishek Das
TGT (Science)

Science with Abhishek Sir

Contents

Chapter numbers are the same as in your NCERT Science textbook, Class 10




FRONT PAGES

ii Message from the Creator
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CHAPTERS IN THIS BOOK

CHAPTER 5 — Life Processes — Unit II: World of Living — Section A · Biology — PAGE 1

CHAPTER 6 — Control and Coordination — Unit II: World of Living — Section A · Biology — PAGE 54

CHAPTER 7 — How do Organisms Reproduce? — Unit II: World of Living — Section A · Biology — PAGE 124

CHAPTER 8 — Heredity — Unit II: World of Living — Section A · Biology — PAGE 204

CHAPTER 13 — Our Environment — Unit V: Natural Resources — Section A · Biology — PAGE 239

END PAGES

★ Top Questions of the Book
✓ Revision Checklist
✎ My Notes

⚠ **Note:** Some chapter numbers are skipped because they follow NCERT: Ch 1–4 are in the Chemistry book; Ch 9, 10, 11 and 12 are in the Physics book. All chapters in this book come in **Section A (Biology)** of the Board paper, which carries 30 marks: Unit II World of Living (25) + Unit V Natural Resources (5).

How to Read a Question Box

Every question in this book is set out in the same way

A SAMPLE QUESTION BOX (Ch 13 · Q23 — one of the most asked questions)

Q23 | **Very Short Answer** · 2 marks ★★★ | **Board ×7** | 14 papers

List two reasons to show that the existence of decomposers is essential in an ecosystem.

Source
CBSE 2023: 31/1/2 Q21 · CBSE 2024: 31/3/1 Q26 · CBSE 2026: 31/4/3 Q10; 31/7/3 Q11; 31/8/3 Q14 · KVS Raipur PB-2 2025-26: Q31 · … (14 papers in all)

✓ Answer
• Decomposers (bacteria, fungi) break down the complex organic substances of dead plants and animals into simple inorganic substances that go into the soil — natural replenishment of the soil (1).
• They act on garbage/dead remains and clean the environment; without them dead bodies and wastes would pile up and nutrients would not be recycled (1).

⚠ **Note:** In the 2024 and 2026 papers the same idea was asked as "What are decomposers? List two roles …".

Border colour = the theme of the chapter the question belongs to.

1. **Question number** — Colour of this box shows the question type.
2. **Type and marks** — MCQ, A–R, very short, short, long or case-based.
3. **Stars** — ★★★ asked in 6 or more papers · ★★ in 3–5 · ★ in 1–2.
4. **Board ×n** — Came in n different CBSE board exams.
5. **Papers** — All papers in which it came (board, sample, KVS, Sahodaya).
6. **The question** — As it came in the paper. A figure from the paper is shown below it.
7. **Source strip** — Exactly which papers asked it.
8. **Answer** — In NCERT words, with marks in brackets.
9. **Note** — Only when needed — a trap, a change or a working tip.

QUESTION TYPES AND THEIR COLOURS

- Multiple Choice · 1 mark
- Assertion-Reason · 1 mark
- Very Short Answer · 2 marks
- Short Answer · 3 marks
- Case-based · 4 marks
- Long Answer · 5 marks

OTHER MARKS YOU WILL SEE

Board ×3	Asked in 3 different CBSE board exams. Sets of one exam count once.
NEW	Not a past-paper question — written to give practice on a part with few past questions.
Figure from the question paper	The real figure cut from the paper. A re-drawn figure is labelled as re-drawn.

HOW EACH CHAPTER IS ARRANGED

Chapter cover (what was searched) ▸ **Concept map** (what is asked from where) ▸ **Must-do 20** (learn these first) ▸ **Questions** (theme by theme) ▸ **Summary** (counts + top 10)

Exam at a Glance

CBSE Class 10 Science (086) · Session 2026-27 · where Biology fits in the paper

80	30	39	20
marks theory paper	marks for Biology	questions in the paper	marks internal
3 hours	Section A of the paper	with internal choice	assessment

THE 80-MARK THEORY PAPER — THREE SECTIONS

Section A · Biology · 30 marks ← this book

Unit II World of Living · 25	5	Section B · Chemistry · 25	Section C · Physics · 25
Ch 5, 6, 7, 8	Ch 13	Ch 1–4	Ch 9–12

Unit V Natural Resources (5 marks) has only one chapter in the syllabus: Our Environment.

KINDS OF QUESTIONS AND THEIR MARKS

Multiple Choice	Assertion-Reason	Very Short Answer	Short Answer	Case-based	Long Answer
1 mark	1 mark	2 marks	3 marks	4 marks	5 marks

WHAT IS IN THIS BOOK — QUESTIONS BY CHAPTER AND TYPE

Chapter	MCQ	A-R	VSA	SA	LA	Case	Total	Starts on
Ch 5 · Life Processes	64	20	34	26	9	10	**163**	p. 1
Ch 6 · Control and Coordination	72	13	40	23	12	22	**182**	p. 54
Ch 7 · How do Organisms Reproduce? (A + B)	43	16	36	26	33	10	**164**	p. 124
Ch 8 · Heredity	29	13	12	12	4	9	**79**	p. 204
Ch 13 · Our Environment	68	32	48	17	3	5	**173**	p. 239
Whole book	**276**	**94**	**170**	**104**	**61**	**56**	**761**	

Two board exams in 2026-27: Exam 1 is for everyone; Exam 2 is optional, for those who want to improve. Both follow the same syllabus and paper design, so every question in this book helps for both.
Where to start: the **Top Questions of the Book** page at the end, then the Must-do 20 of each chapter. Questions marked ★★★ and Board ×n come again and again.
Chapter 7 has two parts: Part A – asexual reproduction and flowering plants (NCERT 7.1–7.3.2); Part B – reproduction in human beings (NCERT 7.3.3).

Marks and paper design as per the CBSE Class X Science (086) curriculum 2026-27.

About this Edition

Which copy do you have? Check the version number below.

PYQ HUNT · BIOLOGY · CLASS 10 · CBSE SCIENCE (086)

Version 1.1

Edition 1 · released 29 September 2026 · syllabus 2026-27

322 pages · 761 questions with answers · 5 chapters

FREE FOR STUDENTS
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What is inside

Chapters 5, 6, 7, 8 and 13 of the NCERT Science textbook (Class 10) – the Biology part of the CBSE paper. Chapter 7 has two parts: Part A (asexual reproduction and flowering plants) and Part B (human reproduction).

Where the questions come from

CBSE board papers (main, supplementary and papers for visually impaired candidates, 2011–2026), CBSE sample papers and competency question banks, KVS and Sahodaya pre-board papers and other practice papers. Every question shows its source. A few questions from practice papers have been reworded. Questions marked NEW were written to cover a part of the syllabus with few past questions.

Answers

Answers follow the NCERT textbook, with marks in brackets. For a board exam, the CBSE marking scheme of that year is final.

Found a mistake?

Tell your teacher or write to Abhishek Das, TGT (Science) through sciencewithabhisheksir.in. Corrections will be made in the next version.

VERSION HISTORY

Version	Date	What changed
1.0	29 Sep 2026	First eBook: five chapter banks joined with front pages, contents, top questions, checklist.
1.1	29 September 2026	Chapter 7 Part A added (83 questions: asexual reproduction, flowering plants). Questions from one set of practice papers reworded. Board-paper count on the cover corrected to 62. "In this chapter" lists on chapter covers; edition page; checklist and top-question pages tidied.

Science with Abhishek Sir

Prepared by Abhishek Das, TGT (Science)

PYQ HUNT · Chapter 5 · Life Processes

CBSE Class 10 Science (086) · 2026-27 syllabus · Unit II World of Living · chapterwise question bank with answers

12	47	216	155
files searched (all PYQ HUNT files)	papers with this chapter found	question appearances found	unique questions after clubbing (+8 NEW)

What I went through

Kind of paper	Papers with Life Processes	Examples
CBSE board papers (main, supplementary, VI)	19	2023 (31/1, 31/2, 31/4, 31/5, 31/6), 2024 (31/3, 31/4), 2025 (31/2, 31/6), 2026 (31/2, 31/4, 31/5, 31/7, 31/8), VI papers, supplementary 31/S/1–3
CBSE SQP, CFPQ and competency banks	4	SQP 2025-26, Competency Focused Practice Questions, CBSE competency item bank, CBSE–SAS items
KVS pre-boards, monthly and periodic tests	15	KVS Lucknow Region pre-boards 2022-23 to 2025-26, KVS Delhi PB-II 2024-25, KVS Raipur PB 2025-26, KV Sitapur periodic tests
Other sample / practice papers	9	Sample Question Papers 3–8 (F8), Bangalore Sahodaya pre-boards (F5), sample papers in F6; KVS 8-page test (F9)
Total	47	88 questions came in CBSE board papers

In this chapter

Chapter cover	p. 1	Concept map	p. 2
Must-do 20	p. 3	Life processes and modes of nutrition	p. 4
Photosynthesis and stomata	p. 6	Nutrition in human beings	p. 14
Breakdown of glucose (aerobic and anaerobic)	p. 24	Human respiratory system and exchange of gases	p. 29
Human heart and double circulation	p. 35	Blood vessels, blood and lymph	p. 40
Transportation in plants	p. 44	Excretion in human beings	p. 47
Excretion in plants	p. 51	Summary	p. 53

How to read a question box: see page iv at the front of the book.

Concept map — what is asked from each part of the chapter

NUTRITION	**Life processes and modes of nutrition** 9 questions · 11 appearances · 4 in board papers *Most asked:* An organism which breaks down the food material outside the body and then...	**Photosynthesis and stomata** 23 questions · 28 appearances · 11 in board papers *Most asked:* Opening and closing of stomata is due to :	**Nutrition in human beings** 37 questions · 45 appearances · 21 in board papers *Most asked:* Write two roles each of (i) bile juice and bile salts and (ii) pancreatic...
RESPIRATION	**Breakdown of glucose (aerobic and anaerobic)** 17 questions · 24 appearances · 10 in board papers *Most asked:* During vigorous exercise, the occurrence of cramps in the outer muscles of an...	**Human respiratory system and exchange of gases** 19 questions · 23 appearances · 9 in board papers *Most asked:* Give reasons : (a) During a breathing cycle, the lungs always contain a...	
TRANSPORTATION	**Human heart and double circulation** 20 questions · 32 appearances · 13 in board papers *Most asked:* Briefly mention the steps in double circulation through human heart.	**Blood vessels, blood and lymph** 11 questions · 11 appearances · 4 in board papers *Most asked:* One-cell thick blood vessels are known as :	**Transportation in plants** 10 questions · 16 appearances · 8 in board papers *Most asked:* Explain how transportation of water in xylem differs from transportation of...
EXCRETION	**Excretion in human beings** 14 questions · 23 appearances · 7 in board papers *Most asked:* (a) Name the organs that form the excretory system in human beings. (b) Draw...	**Excretion in plants** 3 questions · 3 appearances · 1 in board papers *Most asked:* Explain in brief two ways by which leaves of a plant help in excretion.	

Theme map (NCERT section order)

Theme	Sub-theme	NCERT	MCQ	A-R	VSA	SA	LA	Case	Total
Nutrition	Life processes and modes of nutrition	5.1, 5.2	5	1	1	1	0	1	9
Nutrition	Photosynthesis and stomata	5.2.1	14	1	2	2	2	2	23
Nutrition	Nutrition in human beings	5.2.2–5.2.4	15	5	8	5	2	2	37
Respiration	Breakdown of glucose (aerobic and anaerobic)	5.3	7	1	2	5	1	1	17
Respiration	Human respiratory system and exchange of gases	5.3	6	3	4	4	2	0	19
Transportation	Human heart and double circulation	5.4.1	7	6	5	2	0	0	20
Transportation	Blood vessels, blood and lymph	5.4.1	4	1	3	2	0	1	11
Transportation	Transportation in plants	5.4.2	3	1	4	2	0	0	10
Excretion	Excretion in human beings	5.5.1	2	1	4	2	2	3	14
Excretion	Excretion in plants	5.5.2	1	0	1	1	0	0	3
	Total		64	20	34	26	9	10	163

Must-do 20 — asked most often

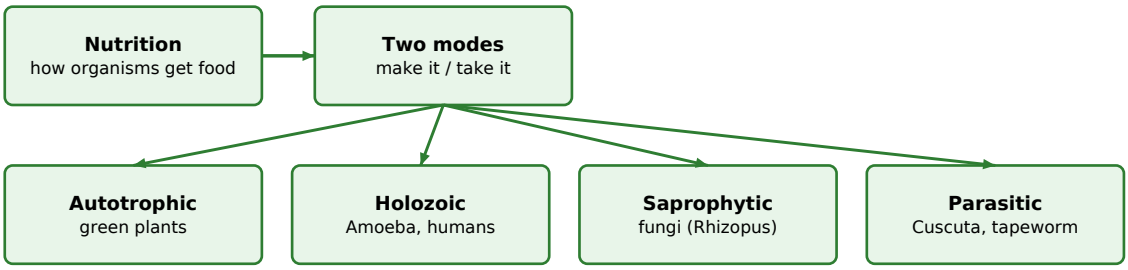
Sorted by number of board papers, then total papers

#	Q no.	Question	Type	Board	Papers
1	Q119	Briefly mention the steps in double circulation through human heart.	VSA	3	8
2	Q10	Opening and closing of stomata is due to :	MCQ	3	4
3	Q53	Write two roles each of (i) bile juice and bile salts and (ii) pancreatic enzymes in the process of digestion.	VSA	3	4
4	Q120	(a) Why is it important to prevent oxygenated and deoxygenated blood from mixing in birds and mammals? (b) Which...	VSA	2	3
5	Q162	Explain in brief two ways by which leaves of a plant help in excretion.	VSA	2	3
6	Q80	During respiration, glucose is broken down into pyruvate. State the end products formed from it on further...	SA	2	2
7	Q96	Give reasons : (a) During a breathing cycle, the lungs always contain a residual volume of air. (b) As compared to...	VSA	2	2
8	Q100	(i) List any two characteristics of lungs which make them an efficient respiratory system. (ii) Name the part of...	SA	2	2
9	Q106	Select the correct statements from the following about the human heart : (i) Right atrium receives oxygenated...	MCQ	2	2
10	Q107	The valves in the human heart ensure that (i) Oxygen-rich blood flows from left atrium to left ventricle only....	MCQ	2	2
11	Q154	(i) What is meant by excretion? (ii) Name the organ that connects the kidneys with the urinary bladder. State its...	SA	2	2
12	Q141	Explain how transportation of water in xylem differs from transportation of food in phloem.	VSA	1	4
13	Q25	List the events in proper sequence that take place during the process of photosynthesis.	VSA	1	3
14	Q70	During vigorous exercise, the occurrence of cramps in the outer muscles of an athlete is due to the conversion of...	MCQ	1	3
15	Q71	In which of the following structures of a cell does the process of breakdown of pyruvate using oxygen to form...	MCQ	1	3
16	Q145	We water the soil but it reaches the topmost leaves of the plants. Explain in brief the process involved.	SA	1	3
17	Q1	An organism which breaks down the food material outside the body and then absorbs it is	MCQ	1	2
18	Q6	Assertion (A): Amoeba takes in food using finger like extensions of the cell surface. Reason (R): In all...	AR	1	2
19	Q34	In the human alimentary canal, when the process of digestion is completed, the (i) carbohydrates, (ii) fats, and...	MCQ	1	2
20	Q54	Give the name of the enzyme present in the fluid in our mouth cavity. State the gland which produces it. What...	VSA	1	2

Nutrition · Life processes and modes of nutrition

9 questions · 11 appearances · 4 in board papers · Autotrophic vs heterotrophic nutrition; saprophytes, parasites; nutrition in Amoeba and Paramecium · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 5 questions

Q1 **Multiple Choice** · 1 mark ★ Board ×1 2 papers

An organism which breaks down the food material outside the body and then absorbs it is

(a) parasite, Cuscuta
(b) an animal parasite, Tapeworm
(c) a bacteria, Rhizobium
(d) a fungi, Rhizopus

Source: CBSE 2023 · 31/1/1 Q8, 31/1/2 Q12, 31/1/3 Q9 [F1 p156] | KVS Lucknow First Pre-board 2024-25 Q7 [FM p29]
Also asked as: KVS PB 2024-25: 'In which of the following organisms is food broken down outside the body?' — (b) Mushroom.

✔ **Answer**
(d) a fungi, Rhizopus. Fungi like bread moulds break down food outside the body and then absorb it (saprophytic nutrition).

Q2 **Multiple Choice** · 1 mark ★ 2 papers

The mode of nutrition found in unicellular protozoa Amoeba is:

(a) Holozoic
(b) Saprotrophic
(c) Parasitic
(d) Insectivorous

Source: KVS Lucknow Pre-board-I 2023-24 Q7 [FM p41] | KV Sitapur PT-I 2023 Q1 (nutrition in humans — holozoic) [FM p12]

✔ **Answer**
(a) Holozoic. Amoeba takes in whole food particles and digests them inside a food vacuole.

Q3 **Multiple Choice** · 1 mark ★ 1 paper

Select the group in which all organisms have the same mode of nutrition.

(a) Cuscuta, yeast, legumes, leeches and tapeworm
(b) Cactus, ticks, lice, leeches and cow
(c) Cuscuta, ticks, lice, leeches and tapeworm
(d) Cactus, grass, lice, lion and tapeworm

Source: CBSE SQP 2025-26 Q1 [F8 p304]

✔ **Answer**
(C) Cuscuta, ticks, lice, leeches and tapeworm — all are parasites.

Q4 **Multiple Choice** · 1 mark ★ 1 paper

Which one of the following correctly matches the organism with its nutrition type?

(a) Amoeba — Parasite
(b) Cuscuta — Saprophytic
(c) Lichen — Symbiotic
(d) Fungus — Holozoic

Source: KVS Lucknow Pre-board 2025-26 Q1 [FM p79]

✔ **Answer**
(c) Lichen — Symbiotic. (Amoeba is holozoic, Cuscuta is a parasite, fungi are saprophytic.)

Q5 **Multiple Choice** · 1 mark ★ 1 paper

The autotrophic mode of nutrition requires

(a) carbon dioxide and water
(b) chlorophyll
(c) sunlight
(d) all of the above

Source: KVS Lucknow 1st Pre-board 2022-23 Q9 [FM p16]
Also asked as: KV Sitapur PT-I 2024: 'characteristic feature of autotrophic nutrition' — ability to synthesize their own food [FM p7].

✔ Answer
(d) all of the above — carbon dioxide and water, chlorophyll and sunlight.

Assertion–Reason · 1 question

Q6 **Assertion–Reason** · 1 mark ★ Board ×1 2 papers

Assertion (A): Amoeba takes in food using finger like extensions of the cell surface.
Reason (R): In all unicellular organisms, the food is taken in by the entire cell surface.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2023 · 31/6/2 Q20 [F9 OCR p15] | Practice sample paper Q18 [F4 p569]

✔ Answer
(C) A is true, but R is false. Amoeba uses finger-like extensions (pseudopodia); but not all unicellular organisms take food by the entire surface — Paramecium has a specific spot for food intake.

Very Short Answer · 1 question

Q7 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Give a diagrammatic representation of nutrition in Amoeba.

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.5 — draw: Amoeba with pseudopodia, food vacuole, nucleus.

Source: CBSE 2026 · 31/5/1 Q10 [F4 p466]

✔ Answer
Diagram (flow) with labels: pseudopodia surround the food particle (1/2) → food vacuole formed (1/2) → complex food broken down into simpler substances which diffuse into the cytoplasm (1/2) → undigested material moved to the surface and thrown out (1/2).

Short Answer · 1 question

Q8 **Short Answer** · 3 marks NEW

What is the difference between autotrophic and heterotrophic nutrition? Give two examples of heterotrophic nutrition by which organisms obtain food from outside, and state how parasites like Cuscuta obtain food.

Source: NEW — NCERT 5.2

✔ Answer
Autotrophic: organisms make their own food from simple inorganic substances (CO_2, water) using sunlight — e.g. green plants (1). Heterotrophic: organisms take in food prepared by others — e.g. animals, fungi (1). Cuscuta (amar-bel) derives nutrition from the plant on which it grows without killing it (parasitic) (1).

Case/Source-based · 1 question

Q9 **Case/Source-based** · 4 marks ★ Board ×1 1 paper

The maintenance functions of every living organism on the earth keep going on even when they are not doing anything particular. The processes which together perform the job of maintenance of life are known as life processes. These processes are nutrition, respiration, transportation and excretion.
(i) List two types of nutrition. (1)
(ii) We eat food. What happens to this food during aerobic respiration in our body? (1)
(iii) (a) What is transpiration? How is it useful to plants? (2)
OR
(iii) (b) Mention the pathway of urine starting from the organ of its formation. Name any two substances which are reabsorbed from the initial filtrate in the tubular part of the nephron. (2)

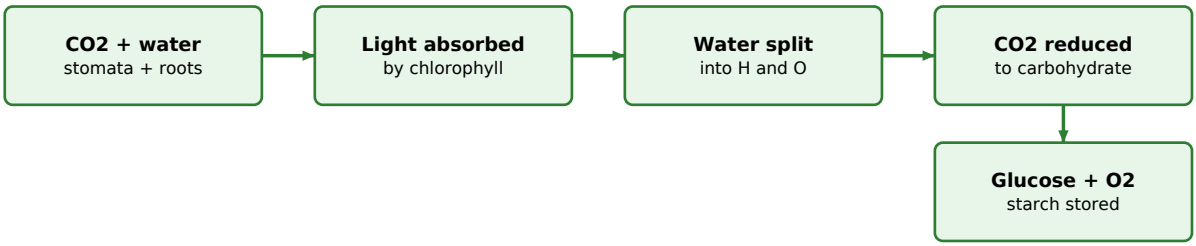
Source: CBSE VI paper 11-31(B) Q39 (yr?) [F9/F2/F3]

✔ Answer
(i) Autotrophic and heterotrophic nutrition. (1)
(ii) Glucose is broken down in the presence of oxygen into carbon dioxide and water, releasing energy (stored as ATP). (1)
(iii)(a) Loss of water in the form of vapour from the aerial parts of the plant (1). Helps in absorption and upward movement of water and minerals from roots to leaves; helps in temperature regulation (1).
OR (b) Kidney → ureter → urinary bladder → urethra (1). Reabsorbed: glucose, amino acids, salts, water (any two) (1).

Nutrition · Photosynthesis and stomata

23 questions · 28 appearances · 11 in board papers · Raw materials, events and equation of photosynthesis; guard cells; starch-test experiments · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 14 questions

Q10 **Multiple Choice** · 1 mark ★★ Board ×3 4 papers

Opening and closing of stomata is due to :

(a) High pressure of gases inside the cells.
(b) Movement of water in and out of the guard cells.
(c) Stimulus of light in the guard cells.
(d) Diffusion of CO2 in and out of the guard cells.

Source: CBSE VI 31(B)/S CDBA/S Q15 (yr?) [F1 p9] | CBSE 2023 · 31/4/1 Q9, 31/4/3 Q8 [F1 p361, 434] | CBSE 2025 · 31/2/1 Q6 ('regulated by ... amount of water in guard cells') [F9/F2/F3] | Sample paper Q6 [F6]

✔ Answer
(b) Movement of water in and out of the guard cells. Guard cells swell when water flows in (pore opens) and shrink when water flows out (pore closes).

Q11 **Multiple Choice** · 1 mark ★ 2 papers

The chlorophyll in photosynthesis is used for

(a) Absorbing light
(b) Breaking down water molecule
(c) No function
(d) Reduction of CO2

Source: KVS Lucknow 1 Pre-board Q8 [FM p53] | KV Sitapur PT-I 2023 Q3 (raw materials: water and carbon dioxide) [FM p12]

✔ **Answer**
(a) Absorbing light (light energy).

Q12 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Identify the part that controls the closing and opening of the stomatal pore in leaves of plants.

(a) Stomata
(b) Epidermal cells
(c) Guard cells
(d) Chloroplasts

Source: CBSE 2026 · 31/5/1, 31/5/2 Q1/Q3 [F4 p462, 494]

✔ **Answer**
(C) Guard cells.

Q13 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

If the stomatal pore is open, it indicates which situation from the following ?

(a) The guard cells have shrunk.
(b) The water comes out of the guard cells.
(c) Large amount of water is lost through stomata.
(d) The guard cells have swelled due to inflow of water.

Source: CBSE 2026 · 31/2/2 Q4 [F9]

✔ **Answer**
(D) The guard cells have swelled due to inflow of water.

Q14 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

The following events occur during the process of photosynthesis. Choose the option that indicates the correct events.
(i) Oxidation of carbon dioxide to carbohydrates
(ii) Conversion of light energy to chemical energy
(iii) Absorption of light energy by chlorophyll
(iv) Conversion of hydrogen and oxygen into water

(a) (i) and (ii)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iv)

Source: CBSE 2026 · 31/2/2 Q6 [F9]

✔ **Answer**
(B) (ii) and (iii). Carbon dioxide is reduced (not oxidised) to carbohydrates, and water is split into hydrogen and oxygen (not formed).

Q15 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

In the following diagram, identify the cells through which massive amounts of gaseous exchange takes place for photosynthesis :

(a) I
(b) IV
(c) III
(d) II

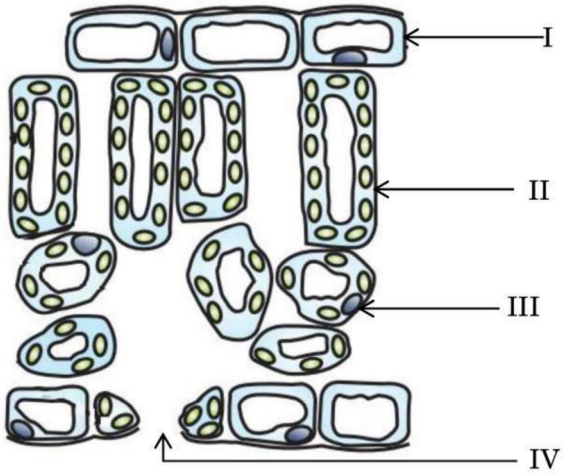


Figure from the question paper

Source: CBSE 2023 · 31/2/1 Q9, 31/2/2 Q12, 31/2/3 Q12 [F1 p184, 213, 238]

✔ Answer
(b) IV — the stoma (between guard cells) in the lower epidermis, through which massive gaseous exchange takes place.

Q16 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

In the given diagram of a closed stomata : (1), (2), (3) and (4) respectively are

(a) nucleus, chloroplast, guard cell, vacuole
(b) nucleus, chloroplast, vacuole, guard cell
(c) chloroplast, nucleus, vacuole, guard cell
(d) vacuole, guard cell, nucleus, chloroplast

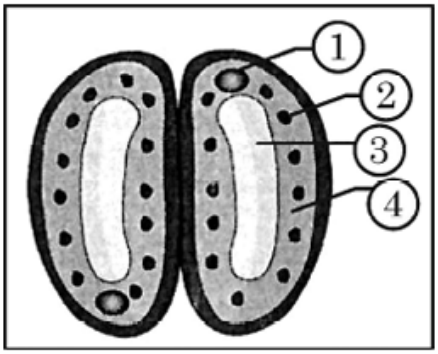


Figure from the question paper

Source: CBSE 2023 · 31/6/1 Q5 [F1]; 31/6/3 Q2 [F9 OCR p37]

✔ Answer
(b) nucleus, chloroplast, vacuole, guard cell.

Q17 **Multiple Choice** · 1 mark ★ 1 paper

A stomata closes when:
A) It needs carbon dioxide for photosynthesis
B) It does not need carbon dioxide for photosynthesis
C) Water flows out of the guard cells
D) Water flows into the guard cells

(a) A only
(b) A and C
(c) B and C
(d) B and D

Source: KVS Lucknow Pre-board-2 2024-25 Q6 [FM p21]

✔ **Answer**
(C) B and C.

Q18 **Multiple Choice** · 1 mark ★ 1 paper

As compared to daytime, the amount of carbon dioxide released by the plants during night is more because:

(a) Plants do not respire during daytime.
(b) It is not produced during daytime.
(c) It is stored in the leaves of plants during daytime.
(d) Major amount of carbon dioxide produced is used up for photosynthesis during daytime.

Source: Sample paper Q1 [F6]

✔ **Answer**
(d) Major amount of carbon dioxide produced is used up for photosynthesis during daytime.

Q19 **Multiple Choice** · 1 mark ★ 1 paper

A black strip of paper was clipped onto a destarched leaf in a potted plant to cover a part of the leaf. The plant was then exposed to sunlight for four hours, the paper strip was removed and the leaf was tested for starch. When iodine solution was added:

(a) The entire leaf turned blue-black.
(b) The uncovered part of the leaf became blue-black.
(c) The colour of the iodine solution remained unchanged.
(d) The covered part of the leaf became blue-black.

Source: Sample paper Q8 [F8 p35]

✔ **Answer**
(b) The uncovered part of the leaf became blue-black — starch is made only where light falls.

Q20 **Multiple Choice** · 1 mark ★ 1 paper

To test the presence of starch on leaf, the leaf is boiled in alcohol within a water bath to

(a) de-starch the leaf
(b) kill the cells
(c) dehydrate the leaf
(d) de-colourise the leaf

Source: KVS Lucknow Pre-board-II 2023-24 Q8 [FM p35]

✔ **Answer**
(d) de-colourise the leaf — alcohol removes the chlorophyll so the colour change with iodine can be seen.

Q21 **Multiple Choice** · 1 mark ★ 1 paper

Those processes which involve the building up of complex molecules from simpler ones are called anabolism. Which of the following life processes can be considered as an example of anabolism?

(a) digestion
(b) respiration
(c) transpiration
(d) photosynthesis

Source: CBSE competency item bank — Life Processes Q3 [F4 p720]

✔ **Answer**
(4) Photosynthesis — simple CO_2 and water are built up into carbohydrate.

Q22 **Multiple Choice** · 1 mark ★ 1 paper

The important functions of the structure shown below is/are:

(a) Photosynthesis
(b) Transpiration
(c) Respiration
(d) All of these

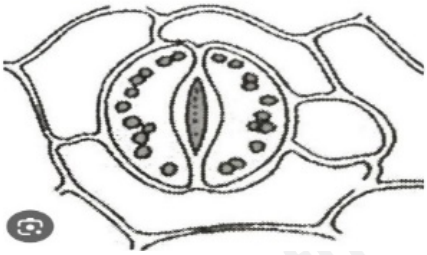


Figure from the question paper

Source: KVS Lucknow Pre-board-I 2023-24 Q8 [FM p41]

✔ **Answer**
(d) All of these — the structure is a stoma; it allows exchange of gases for photosynthesis and respiration, and loss of water (transpiration).

Q23 **Multiple Choice** · 1 mark ★ 1 paper

During a practical experiment, a student covers a part of a green leaf with black paper and exposes the leaf to sunlight for a few hours. After testing the leaf for starch, which part will not show the starch presence?

(a) The covered part of the leaf
(b) The uncovered green part of the leaf
(c) The veins of the leaf
(d) The entire leaf

Source: Bangalore Sahodaya PB-1 2025-26 Q1 (VI version) [F5 p544]

✔ **Answer**
(A) The covered part of the leaf — no light reached it, so no photosynthesis and no starch.

⚠ **Note:** The main paper uses a figure (parts B, C, D); the version for visually impaired students is given here.

Assertion–Reason · 1 question

Q24 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Photosynthesis occurs in the chloroplasts of plant cells.
Reason (R): Chlorophyll, present in chloroplasts, absorbs light energy necessary for the process of photosynthesis.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: KV Sitapur PT-I 2024 A-R Q2 [FM p8]

✔ **Answer**
(A) Both true and R explains A.

Very Short Answer · 2 questions

Q25 **Very Short Answer** · 2 marks ★★ Board ×1 3 papers

List the events in proper sequence that take place during the process of photosynthesis.

Source: CBSE 2023 · 31/5/2 Q25(a) [F1 p495] | KVS Lucknow Pre-board-I 2023-24 Q30 OR (3 marks) [FM p44] | KVS Lucknow Pre-board 2025-26 Q15(b) [FM p80]

✔ **Answer**
(i) Absorption of light energy by chlorophyll. (ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen. (iii) Reduction of carbon dioxide to carbohydrates. (1/2 + 1 + 1/2)

Q26 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Two green plants are kept separately in oxygen free containers, one in the dark and other in sunlight. It was observed that plant kept in dark could not survive longer. Give reason for this observation.

Source: CBSE 2023 · 31/4/1 Q24 [F1 p365]

✔ **Answer**
In sunlight the plant photosynthesises and releases oxygen, which it uses for respiration (1). In the dark there is no photosynthesis, so no oxygen is produced; the plant cannot respire aerobically/get energy and dies (1).

Short Answer · 2 questions

Q27 **Short Answer** · 3 marks ★ Board ×1 1 paper

Write in sequence the steps for experimental verification of the fact that sunlight is essential for photosynthesis.

Source: CBSE 2023 · 31/2/1 Q29(b), 31/2/2 Q33(b) [F1 p194, 223]

✔ **Answer**
1. Keep a potted plant in the dark for about three days to destarch the leaves. (1/2)
2. Cover a part of a leaf on both sides with black paper strips and keep the plant in sunlight for a few hours. (1/2)
3. Pluck the leaf, remove the strip, boil it in water and then in alcohol on a water bath to remove chlorophyll. (1/2)
4. Wash and put dilute iodine solution on the leaf. (1/2)
5. Observation: uncovered part turns blue-black; covered part does not. (1/2)
6. Conclusion: starch is formed only where light falls — sunlight is essential for photosynthesis. (1/2)

Q28 **Short Answer** · 3 marks NEW

Desert plants keep their stomata closed during the day. How do they still carry out photosynthesis? Why is this useful to them?

Source: NEW — NCERT 5.2.1

✔ Answer

They take up carbon dioxide at night (stomata open at night) and store it as an intermediate (1). During the day the stored CO_2 is used for photosynthesis with the energy absorbed by chlorophyll (1). Closing stomata in the day prevents loss of water by transpiration in the hot desert (1).

Long Answer · 2 questions

Q29 **Long Answer** · 5 marks ★ Board ×1 1 paper

(a) Draw a labelled diagram showing open and closed stomatal pore.
(b) List the main events that occur during the process of photosynthesis.
(c) Write a balanced chemical equation showing photosynthesis in plants.

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.3 (a) open and (b) closed stomatal pore.

Source: CBSE 2026 · 31/4/2 Q16(A), 31/4/3 Q16(A) [F4 p406, 438]

✔ Answer

(a) Diagram: open and closed stomatal pore with labels guard cells, stomatal pore, chloroplast, nucleus, (epidermal cells). (2)
(b) Absorption of light energy by chlorophyll; conversion of light energy to chemical energy and splitting of water into hydrogen and oxygen; reduction of carbon dioxide to carbohydrates. (1 1/2)
(c) $6CO_2 + 12H_2O \xrightarrow{\text{(chlorophyll, sunlight)}} C_6H_{12}O_6 + 6O_2 + 6H_2O$ (1 1/2)

Q30 **Long Answer** · 5 marks ★ Board ×1 1 paper

(i) Given below is a diagram showing cross-section of a leaf. Name the parts marked as A and B and write one specific function of each.
(ii) Name the two tissues present in a vascular bundle. In what way does each of them help a plant?
(iii) In the experiment 'Light is essential for photosynthesis', why does the uncovered part of the leaf turn blue-black after putting iodine solution on it?

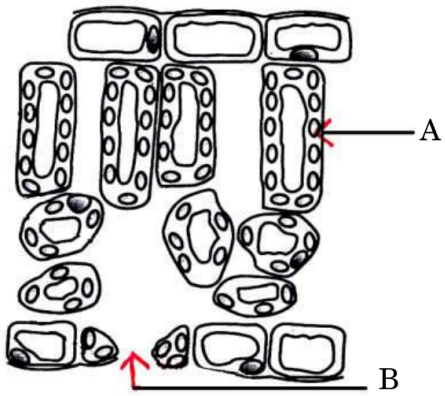


Figure from the question paper

Source: CBSE supplementary 31/S/3 Q35(b) (yr?) [F4 p319]

✔ Answer

(i) A — chloroplast (in palisade cells): site of photosynthesis; B — stoma (stomatal pore): exchange of gases and loss of water (transpiration) (2).
(ii) Xylem — carries water and minerals from roots to other parts; phloem — carries food (products of photosynthesis) from leaves to other parts (2).
(iii) The uncovered part received light, made starch by photosynthesis; starch gives blue-black colour with iodine (1).

Case/Source-based · 2 questions

Q31 **Case/Source-based** · 3 marks ★ 1 paper

Rahul conducted an experiment to understand the process of photosynthesis. He placed a potted plant in a dark room for 48 hours to ensure that the plant uses up all the stored starch. Then, he covered one of the leaves with a black paper and placed the plant in sunlight for 6 hours. After this, he performed a starch test on the leaf. The part covered with black paper did not turn blue-black, while the uncovered part turned blue-black.
(a) Why was the potted plant kept in the dark for 48 hours?
(b) Explain why the part covered with black paper did not turn blue-black.
(c) What conclusion can be drawn about the necessity of light in photosynthesis?

Source: KV Sitapur PT-I 2024 Case [FM p8]
Also asked as: KVS Lucknow Pre-board 2025-26 Q15 (Riya's two potted plants, dark vs sunlight) — role of chlorophyll, three events, why no starch in dark / why stomata are essential [FM p80].

✔ Answer
(a) To destarch the leaves — the plant uses up the stored starch. (1)
(b) Light could not reach that part, so no photosynthesis and no starch was formed there. (1)
(c) Sunlight is necessary for photosynthesis. (1)

Q32 **Case/Source-based** · 4 marks ★ 1 paper

The figure shown represents an activity to prove the requirement for photosynthesis. Two healthy potted plants are kept in the dark for 72 hours. After 72 hours, KOH is kept in the watch glass in set-up X and not in set-up Y. Both set-ups are airtight and kept in light for 6 hours. Then iodine test is performed with one leaf from each of the plants X and Y.
(a) The set-up is used to prove the essentiality of which requirement of photosynthesis?
(b) What is the function of potassium hydroxide in the process?
(c) Write the chemical equation involved in the process of photosynthesis.
OR
(c) Write the chemical equation that takes place anaerobically in plants (yeast).

▣ **Diagram to draw / re-drawn:** Set-up X (with KOH) and Y (without KOH) — NCERT Activity 5.2.

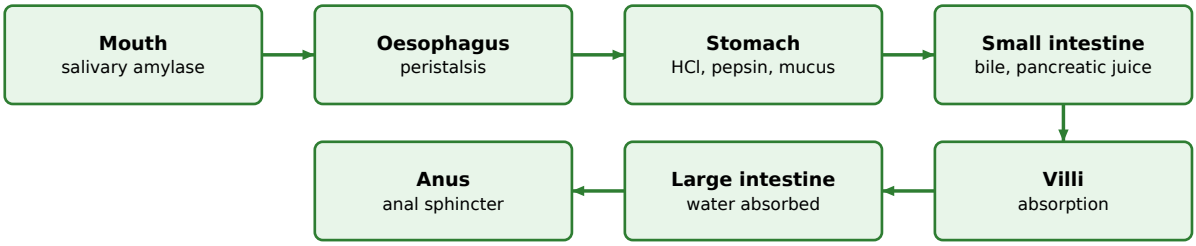
Source: KVS Lucknow 1st Pre-board 2022-23 Q38 [FM p19]

✔ Answer
(a) Carbon dioxide is essential for photosynthesis. (1)
(b) KOH absorbs carbon dioxide from the air inside the bell jar. (1)
(c) $6CO_2 + 12H_2O$ --(sunlight, chlorophyll)--> $C_6H_{12}O_6 + 6O_2 + 6H_2O$ (2)
OR (c) Glucose → (in cytoplasm) pyruvate (3-carbon) + energy → (absence of oxygen) ethanol + carbon dioxide + energy (2)

Nutrition · Nutrition in human beings

37 questions · 45 appearances · 21 in board papers · Alimentary canal, enzymes, bile, peristalsis, sphincters, villi · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 15 questions

Q33 **Multiple Choice** · 1 mark ★★ 3 papers

In which part of the alimentary canal food is finally digested?

(a) Stomach
(b) Mouth cavity
(c) Small intestine
(d) Large intestine

Source: KV Sitapur PT-I 2023 Q2 [FM p12] | Sample Question Paper-3 (2024-25) Q12 [F8 p3] | Practice sample paper Q12 [F4 p600]

✔ Answer
(c) Small intestine.

Q34 **Multiple Choice** · 1 mark ★ Board ×1 2 papers

In the human alimentary canal, when the process of digestion is completed, the (i) carbohydrates, (ii) fats, and (iii) proteins get converted respectively into :

(a) (i) glucose, (ii) fatty acids and (iii) amino acids
(b) (i) glucose, (ii) fatty acids and glycerol and (iii) amino acids
(c) (i) fatty acids and glycerol, (ii) amino acids and (iii) glucose
(d) (i) amino acids, (ii) fatty acids and glycerol and (iii) sugars

Source: CBSE VI 31(B)/S EFGH/S Q9 (yr?) [F1 p36] | KVS Lucknow Monthly Exam Oct 2024-25 Q4 (order: proteins, carbohydrates, fats) [FM p3]

✔ Answer
(B) (i) glucose, (ii) fatty acids and glycerol and (iii) amino acids.

Q35 **Multiple Choice** · 1 mark ★ 2 papers

Out of the following organs of human alimentary canal which produces bile juice is:

(a) Stomach
(b) Liver
(c) Gall bladder
(d) Pancreas

Source: KVS Lucknow Pre-board-I 2023-24 Q2 [FM p41] | KV Sitapur PT-I 2023 Case — role of gall bladder: to store bile [FM p12]

✔ Answer
(b) Liver. (Bile is stored in the gall bladder.)

Q36 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Consider the following statements about small intestine and select the one which is NOT correct :

(a) The length of the small intestine in animals differs as it depends on the type of food they eat.
(b) The small intestine is the site of complete digestion of food.
(c) The small intestine receives secretions from liver and pancreas.
(d) The villi of the small intestine absorb water from the unabsorbed food before it gets removed from the body via the anus.

Source: CBSE 2023 · 31/1/1 Q9, 31/1/2 Q11, 31/1/3 Q8 [F1 p156]

✔ Answer
(d) — The villi do not absorb water from unabsorbed food; water is absorbed by the large intestine.

Q37 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Sphincter muscles are present at the exit of :

(a) Stomach and small intestine
(b) Stomach and anus
(c) Small intestine and large intestine
(d) Oesophagus and stomach

Source: CBSE 2023 · 31/2/1 Q8, 31/2/2 Q13, 31/2/3 Q11 [F1 p184, 215, 238]

✔ Answer
(b) Stomach and anus. The sphincter muscle regulates food going from stomach to small intestine, and the anal sphincter regulates exit of faeces.

Q38 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Column I shows enzymes secreted by the glands in the alimentary canal of human beings and Column II indicates the components of food on which enzymes act. Choose the option showing correct matching.

(a) Pepsin — Starch
(b) Trypsin — Proteins
(c) Lipase — Proteins
(d) Amylase — Emulsified fat

Source: CBSE 2023 · 31/6/2 Q5 [F9 OCR p7]
Also asked as: KVS Lucknow Pre-board Q18: 'enzyme responsible for digestion of proteins in the small intestine' — Trypsin [FM p49].

✔ Answer
(b) Trypsin — Proteins.

Q39 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

The inner lining of the small intestine has numerous finger-like projections called villi. Choose the correct option indicating the function of villi.

(a) It increases surface area for digestion of food.
(b) It decreases surface area for absorption of food.
(c) It secretes enzymes required for digestion of food.
(d) It increases surface area for absorption of food.

Source: CBSE VI 31(B) 2026 (3-section) Q1 [F3]

✔ Answer
(D) It increases surface area for absorption of food.

Q40 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Which of the following groups consists entirely of substances that are broken down by an enzyme, lipase?

(a) Carbohydrates, proteins and vitamins
(b) Fats, oils and ghee
(c) Minerals, starch and vitamins
(d) Proteins, sugars and esters

Source: CBSE 2026 · 31/8/1 [F4 p93], 31/8/2 [F4 p127], 31/8/3 [F4 p159]
Also asked as: SAS competency item: Mr. Ayub's pancreas (lipase) malfunctions — digestion of fats is affected [F5].

✔ Answer
(B) Fats, oils and ghee.

Q41 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

In human alimentary canal, the digestive juice secreted by the gastric glands are

(a) Bile, Trypsin, Pepsin
(b) Hydrochloric acid, Pepsin, Mucus
(c) Lipase, Bile, Mucus
(d) Salivary amylase, Pepsin, Bile

Source: CBSE 2025 · 31/6/3 Q12 [F4 p9]

✔ Answer
(B) Hydrochloric acid, Pepsin, Mucus.

Q42 **Multiple Choice** · 1 mark ★ 1 paper

In human alimentary canal, the specific enzyme/juice secreted in locations (i), (ii) and (iii) are

(a) (i) Amylase (ii) Pepsin (iii) Bile
(b) (i) Amylase (ii) Bile (iii) Trypsin
(c) (i) Lipase (ii) Amylase (iii) Pepsin
(d) (i) Trypsin (ii) Bile (iii) Amylase

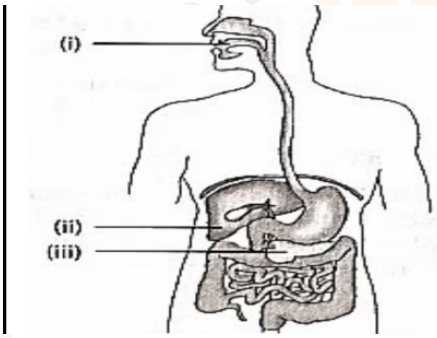


Figure from the question paper

Source: KVS Lucknow Monthly Exam Oct 2024-25 Q7 [FM p3]

✔ Answer
(b) (i) Amylase (ii) Bile (iii) Trypsin — (i) mouth: salivary amylase; (ii) liver: bile; (iii) pancreas: trypsin.

Q43 **Multiple Choice** · 1 mark ★ 1 paper

Which is the correct sequence of body parts in the human alimentary canal?

(a) Mouth → stomach → small intestine → large intestine → oesophagus
(b) Mouth → oesophagus → stomach → small intestine → large intestine
(c) Mouth → stomach → oesophagus → small intestine → large intestine
(d) Mouth → oesophagus → stomach → large intestine → small intestine

Source: KVS Delhi Pre-board-II 2024-25 Q6 [FM p86]

✔ Answer
(b) Mouth → oesophagus → stomach → small intestine → large intestine.

Q44 **Multiple Choice** · 1 mark ★ 1 paper

The main function of saliva in the digestive system is to:

(a) Break down carbohydrates
(b) Absorb water
(c) Transport nutrients
(d) Produce bile

Source: KV Sitapur PT-I 2024 Q10 [FM p7]

✔ Answer
(A) Break down carbohydrates — salivary amylase breaks down starch into sugar.

Q45 **Multiple Choice** · 1 mark ★ 1 paper

Gastroparesis is a disease in which the muscles of the stomach become paralysed and cannot contract or relax. Foods high in fat can delay digestion and emptying of the stomach. Which food would be advised to a patient suffering from gastroparesis?

(a) soups and juices only
(b) soups and chicken salads only
(c) fried chicken and fried rice
(d) ice cream and milk only

Source: CBSE competency item bank — Life Processes Q6 [F4 p722]

✔ Answer
Soups and juices only — liquid, low-fat food needs little churning by stomach muscles.

Q46 **Multiple Choice** · 1 mark ★ 1 paper

The inner lining of stomach is protected by one of the following from hydrochloric acid. Choose the correct one.

(a) Salivary amylase
(b) Pepsin
(c) Mucus
(d) Bile

Source: Sample Question Paper-7 (2024-25) Q8 [F8 p68]

✔ Answer
(c) Mucus.

Q47 **Multiple Choice** · 1 mark ★ 1 paper

The diagram shows what happens to fat globules when they mix with bile. This process is known as-

(a) Digestion
(b) Assimilation
(c) Absorption
(d) Emulsification

Source: Bangalore Sahodaya PB-1 2024-25 Q9 [F5 p3]

✔ Answer
(d) Emulsification — bile salts break large fat globules into smaller globules.

Assertion-Reason · 5 questions

Q48 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : In humans, the inner lining of the small intestine has finger-like projections called villi which are richly supplied with blood vessels.
Reason (R) : Villi increase the surface area for the absorption of digested food.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE VI 31(B)/S CDBA/S Q20 (yr?) [F1 p11]

✔ Answer
(A) Both true and R explains A — villi increase surface area and their blood vessels take the absorbed food to every cell.

Q49 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : The inner walls of the small intestine have finger like projections called villi which are rich in blood.
Reason (R) : These villi have a large surface area to help the small intestine in completing the digestion of food.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2023 · 31/4/1 Q19 [F1 p363]

✔ Answer
(C) A is true, but R is false. Villi increase the surface area for absorption, not for digestion.

Q50 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : The peristaltic movements occur all along the gut.
Reason (R) : The lining of the gut has muscles that contract rhythmically to push the food in regulated manner.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2026 · 31/5/1 Q8, 31/5/2 Q8 [F4 p466, 498]

✔ Answer
(A) Both true and R explains A.

Q51 **Assertion-Reason** · 1 mark ★ 1 paper

Assertion : Bile is essential for digestion of lipids.
Reason : Bile juice contains enzymes.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: KVS Lucknow Pre-board-II 2023-24 Q18 [FM p37]

✔ **Answer**
(C) A is true, but R is false. Bile has no enzyme; bile salts break large fat globules into smaller ones (emulsification).

Q52 **Assertion-Reason** · 1 mark ★ 1 paper

Assertion (A): Hydrochloric acid helps in the digestion of food in the stomach.
Reason (R): Hydrochloric acid creates an acidic medium to activate protein digesting enzymes.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: KVS Lucknow Pre-board 2025-26 Q8 [FM p72]

✔ **Answer**
(A) Both true and R explains A — HCl creates an acidic medium which facilitates the action of pepsin.

Very Short Answer · 8 questions

Q53 **Very Short Answer** · 2 marks ★★ Board ×3 4 papers

Write two roles each of (i) bile juice and bile salts and (ii) pancreatic enzymes in the process of digestion.

Source: CBSE VI 31(B)/S CDBA/S Q23 (yr?) [F1 p13] | CBSE 2023 · 31/2/3 Q22 [F1 p244] | CBSE 2023 · 31/4/2 Q24 ('two reasons why bile juice is an important secretion') [F1 p418] | KVS Lucknow Pre-board-II 2023-24 Q22 ('Bile does not contain any biocatalyst but it is essential for digestion') [FM p37]

✔ **Answer**
(i) Bile juice makes the food coming from the stomach alkaline for pancreatic enzymes to act (1/2); bile salts break large fat globules into smaller globules (emulsification), increasing efficiency of enzyme action (1/2).
(ii) Pancreatic amylase breaks down starch; trypsin digests proteins; lipase breaks down emulsified fats (any two) (1/2 + 1/2).

Q54 **Very Short Answer** · 2 marks ★ Board ×1 2 papers

Give the name of the enzyme present in the fluid in our mouth cavity. State the gland which produces it. What would happen to the digestion process if this gland stops secreting this enzyme?

Source: CBSE 2023 · 31/6/2 Q25, 31/6/3 Q25 [F9 OCR p19, p51] | KV Sitapur PT-I 2023 Q6 (1 mark) [FM p12]

✔ **Answer**
Salivary amylase (1/2), produced by the salivary glands (1/2). Starch would not be broken down into sugar in the mouth (1); its digestion would take place only later in the small intestine by pancreatic amylase.

Q55 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

In the process of digestion of food in human beings, two protein-digesting enzymes are secreted. Name the enzymes along with the glands that secrete them.

Source: CBSE 2023 · 31/5/1 Q24 [F1 p468]

✔ Answer
Pepsin — secreted by the gastric glands in the wall of the stomach (1).
Trypsin — secreted by the pancreas (in pancreatic juice) (1).

Q56 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

In the human digestive system, food is digested with the help of certain enzymes like trypsin and secretions from various glands like bile juice. Name the gland that secretes them and explain their action on food.

Source: CBSE 2026 · 31/7/2 Q12 [F4 p52]

✔ Answer
Trypsin — pancreas; digests proteins (1). Bile juice — liver; makes the food coming from the stomach alkaline for pancreatic enzymes to act, and bile salts break large fat globules into smaller globules (1).

Q57 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Varun is diabetic. His latest ultrasound reports showed a blockage in his pancreatic duct. How will this affect the dual functioning of the pancreas?

Source: CBSE 2026 · 31/4/2 Q10(A) [F4 p404]

✔ Answer
Pancreatic juice (amylase, trypsin, lipase) cannot reach the small intestine, so digestion of starch, proteins and fats will be affected (1). The hormone insulin goes directly into the blood (no duct), so its release is not affected by the blockage (1).

⚠ **Note:** Links Ch 5 (digestion) with Ch 6 (insulin).

Q58 **Very Short Answer** · 2 marks ★ 1 paper

State one role of each of the following in the human digestive system:
A) Hydrochloric acid B) Villi C) Anal sphincter D) Lipase

Source: KVS Lucknow Pre-board-2 2024-25 Q22 [FM p23]

✔ Answer
A) Creates an acidic medium for action of pepsin (and kills germs). B) Increase surface area for absorption of digested food. C) Regulates the exit of waste (faeces) from the body. D) Breaks down emulsified fats. (1/2 each)

Q59 **Very Short Answer** · 2 marks ★ 1 paper

Explain the significance of peristaltic movement that occurs all along the gut during digestion.

Source: KVS Lucknow Pre-board 2025-26 Q11 [FM p72]

✔ Answer
The lining of the canal has muscles that contract rhythmically (1). These peristaltic movements push the food forward in a regulated manner so that it is processed properly in each part of the canal (1).

Q60 **Very Short Answer** · 2 marks ★ 1 paper

a) A patient whose gall bladder is removed is recommended to eat less oily food. Why?
b) What will happen if mucus is not secreted by the gastric glands?
OR
Draw a well labelled diagram of steps of nutrition in Amoeba.

Source: KVS Raipur Region Pre-board 2025-26 Q25 [F5 p301; copy p307]

✔ Answer
a) Bile (stored in the gall bladder) breaks large fat globules into smaller ones; without a store of bile, fats are not digested properly (1).
b) Hydrochloric acid would damage the inner lining of the stomach (1).
OR Diagram: pseudopodia surround food → food vacuole → digestion → undigested food thrown out (NCERT Fig. 5.5) (2).

Short Answer · 5 questions

Q61 **Short Answer** · 3 marks ★ Board ×1 1 paper

(i) Name the movement that occurs all along the gut in the human digestive system. How do these movements help in the digestion of food?
(ii) Where is bile juice stored in the human body? List its two roles.

Source: CBSE VI 31(B)/S EFGH/S Q29(a) (yr?) [F1 p44]

✔ Answer
(i) Peristaltic movement / peristalsis (1/2). Rhythmic contraction of the muscles of the gut pushes food forward so that it is properly processed in each part (1).
(ii) Gall bladder (1/2). Makes the medium alkaline for pancreatic enzymes; bile salts break large fat globules into smaller ones (1/2 + 1/2).

Q62 **Short Answer** · 3 marks ★ Board ×1 1 paper

Name the organ that helps in the digestion of fats in human beings. Also describe its complete digestion into simple form. Where does absorption of food take place in the humans?

Source: CBSE VI 31(B) 2026 (LMNK2) Q14 [F1 p65]

✔ Answer
Small intestine (with liver and pancreas) (1/2). Bile from the liver makes the medium alkaline and bile salts emulsify fats — break large globules into smaller globules (1); lipase from pancreatic juice and intestinal juice finally convert fats into fatty acids and glycerol (1). Absorption: villi of the small intestine (1/2).

Q63 **Short Answer** · 3 marks ★ Board ×1 1 paper

(i) How does Paramecium obtain its food?
(ii) List the role of each of the following in our digestive system:
(a) Hydrochloric acid (b) Trypsin (c) Muscular walls of stomach (d) Salivary amylase

Source: CBSE 2023 · 31/4/1 Q29(A), 31/4/2 Q31(A) [F1 p367, 420]

✔ Answer
(i) Paramecium has a definite shape; food is taken in at a specific spot and moved there by the movement of cilia which cover the entire surface (1).
(ii) (a) HCl makes the medium acidic for the action of pepsin; (b) trypsin digests proteins; (c) muscular walls mix the food thoroughly with digestive juices; (d) salivary amylase breaks down starch into sugar (1/2 each).

Q64 **Short Answer** · 3 marks ★ Board ×1 1 paper

(a) With the help of an activity, explain the action of saliva on the food we eat.
(b) Why is bile juice important in the process of digestion?

Source: CBSE 2023 · 31/5/1 Q29 [F1 p470], 31/5/2 Q31 [F1 p499], 31/5/3 Q30 [F1 p526]

✔ Answer
(a) Take 1 mL starch solution in two test tubes A and B; add 1 mL saliva to A only; after 20–30 minutes add a few drops of dilute iodine solution to both (1). B turns blue-black (starch present), A shows no blue-black colour — salivary amylase has broken starch into sugar (1).
(b) Bile makes the medium alkaline for pancreatic enzymes and bile salts break large fat globules into smaller globules, increasing the efficiency of enzyme action (1).

Q65 **Short Answer** · 3 marks NEW

Food eaten by us is broken down into simple substances. Trace the digestion of starch from the mouth to the small intestine, naming the enzymes involved.

Source: NEW — NCERT 5.2.4

✔ Answer
Mouth: salivary amylase breaks starch into sugar (1). Stomach: no starch digestion; food is mixed and pushed on (1/2). Small intestine: pancreatic amylase breaks remaining starch; enzymes of intestinal juice finally convert carbohydrates into glucose (1 1/2).

Long Answer · 2 questions

Q66 **Long Answer** · 5 marks ★ Board ×1 1 paper

(i) 'The length of the small intestine in various animals depends on the food they eat.' Justify the statement.
(ii) Discuss the role of the pancreas and bile juice in the digestion of food in human beings.
(iii) How is the small intestine designed to absorb digested food?

Source: CBSE 2025 · 31/2/3 Q36(a) [F9/F2/F3]

✔ Answer
(i) Herbivores eating grass need a longer small intestine to allow the cellulose to be digested; meat is easier to digest, so carnivores like tigers have a shorter small intestine (2).
(ii) Pancreas secretes pancreatic juice with amylase (starch), trypsin (proteins) and lipase (emulsified fats) (1). Liver's bile makes food alkaline; bile salts break fats into smaller globules (1).
(iii) Inner lining has numerous finger-like projections (villi) which increase the surface area; villi are richly supplied with blood vessels which take absorbed food to every cell (1).

Q67 **Long Answer** · 5 marks ★ 1 paper

(a) Draw a diagram depicting human alimentary canal and label on it: gall bladder, liver and pancreas.
(b) State the roles of liver and pancreas.
(c) Name the organ which performs the following functions in humans: (i) Absorption of digested food (ii) Absorption of water.

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.6 Human alimentary canal.

Source: KVS Delhi Pre-board-II 2024-25 Q35 OR [FM p92]

✔ Answer
(a) Labelled diagram (NCERT Fig. 5.6) (2). (b) Liver secretes bile — makes medium alkaline, emulsifies fats; pancreas secretes pancreatic juice — amylase, trypsin, lipase (2). (c) (i) Small intestine (villi) (ii) Large intestine (1).

Case/Source-based · 2 questions

Q68 **Case/Source-based** · 4 marks ★ 2 papers

Neha consumed boiled sweet potatoes and boiled eggs for breakfast. Help her to understand some steps in the process of digestion of the food taken by her by answering the questions given below. Attempt either subpart A or B.
A. Which of these food items is rich in proteins? In which part of the alimentary canal is the digestion of this component initiated? Name the enzymes, conditions required and the glands associated with the digestion here.
OR
B. Which of these food items contains fats? How is it digested?
C. Which of these food items is rich in starch? How is its digestion initiated?
D. The figure given below represents parts of the human alimentary canal. Which of these parts will have the maximum amount of digested food as soon as the process of digestion is completed?

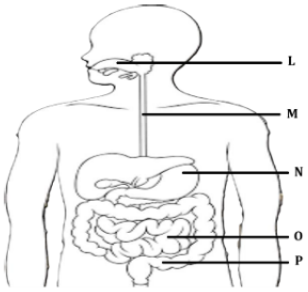


Figure: Human Alimentary canal

Figure from the question paper

Source: CBSE SQP 2025-26 Q15 [F8 p306; marking scheme p320] | Sample Paper 2025-26 (copy) [F5 p285]

✔ Answer
A. Eggs; stomach; gastric glands release hydrochloric acid, the protein-digesting enzyme pepsin and mucus; HCl creates an acidic medium which facilitates the action of pepsin (2).
OR B. Eggs; bile from the liver breaks large fat globules into smaller ones and makes the medium alkaline; emulsified fats are digested by lipase secreted by the pancreas (2).
C. Sweet potatoes; salivary amylase in saliva breaks down starch into sugar in the mouth (1).
D. O — the small intestine, where digestion is completed (1).

Q69 **Case/Source-based** · 4 marks ★ Board ×1 1 paper

Human digestive system is a tube running from mouth to anus. Its main function is to break down complex molecules present in the food which cannot be absorbed as such into smaller molecules. These molecules are absorbed across the walls of the tube and the absorbed food reaches each and every cell of the body where it is utilised for obtaining energy.
(a) Name the glands present in the buccal cavity and write the components of food on which the secretion of these glands act upon. (1)
(b) Two organs have a sphincter muscle at their exit. Name them. (1)
(c) What will happen if: (i) mucus is not secreted by the gastric glands, (ii) villi are absent in the small intestine. (2)
OR
(c) 'Bile juice does not contain any enzyme, yet it has important roles in digestion.' Justify the statement. (2)

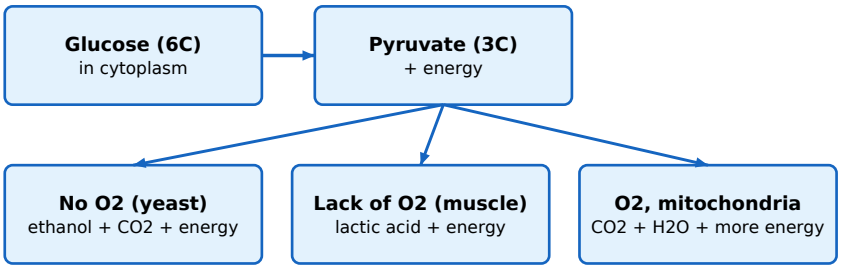
Source: CBSE 2024 · 31/3/1 Q38, 31/3/2 Q38, 31/3/3 Q38 [F1 p287, 319, 351]

✔ Answer
(a) Salivary glands; saliva (salivary amylase) acts on starch (1).
(b) Stomach and anus (1).
(c)(i) The acid would damage the inner lining of the stomach (1). (ii) Absorption of digested food would be very poor as the surface area would be small (1).
OR (c) Bile makes the acidic food from the stomach alkaline for pancreatic enzymes to act (1); bile salts break large fat globules into smaller ones, increasing the efficiency of enzyme action (1).

Respiration · Breakdown of glucose (aerobic and anaerobic)

17 questions · 24 appearances · 10 in board papers · Pyruvate, mitochondria, lactic acid, yeast, ATP · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 7 questions

Q70 **Multiple Choice** · 1 mark ★★ Board ×1 3 papers

During vigorous exercise, the occurrence of cramps in the outer muscles of an athlete is due to the conversion of pyruvate to :

(a) Glucose
(b) Ethanol
(c) Lactic acid
(d) Lactose

Source: CBSE 2023 · 31/2/1 Q10, 31/2/2 Q14, 31/2/3 Q13 [F1 p186, 215, 240] | KVS Lucknow First Pre-board 2024-25 Q14 [FM p30] | KVS Lucknow Pre-board-II 2023-24 Q9 [FM p35]

✔ Answer
(c) Lactic acid — lack of oxygen in muscle cells converts pyruvate into lactic acid (3-carbon), whose build-up causes cramps.

Q71 **Multiple Choice** · 1 mark ★★ Board ×1 3 papers

In which of the following structures of a cell does the process of breakdown of pyruvate using oxygen to form carbon dioxide, water and energy take place?

(a) Nucleus
(b) Mitochondria
(c) Cytoplasm
(d) Chloroplast

Source: CBSE VI 31(B) 2026 (3-section) Q5 [F3] | KVS Lucknow 1st Pre-board 2022-23 Q10 [FM p16] | KVS Lucknow First Pre-board 2024-25 Q4 [FM p29]

✔ Answer
(B) Mitochondria.

Q72 **Multiple Choice** · 1 mark ★ 2 papers

Which of the following options indicates the products formed after breakdown of the glucose in our muscle cells when there is lack of oxygen?

(a) Ethanol + carbon dioxide + Energy
(b) Lactic acid + Energy
(c) Lactic acid + carbon monoxide + Energy
(d) Carbon dioxide + Water + Energy

Source: CBSE SQP 2025-26 Q2 [F8 p304] | KVS Lucknow Pre-board 2025-26 Q2 [FM p79]

✔ Answer
(B) Lactic acid + Energy.

Q73 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Choose the equation of reaction that correctly represents anaerobic respiration in muscles.

(a) Glucose → Pyruvate → (absence of O2) Ethanol + CO2 + Energy
(b) Glucose → Pyruvate → Energy
(c) Glucose → Pyruvate → (lack of oxygen) Ethanol + Energy
(d) Glucose → Pyruvate → (lack of oxygen) Lactic acid + Energy

Source: CBSE 2026 · 31/5/1, 31/5/2 [F4 p462, 494]

✔ Answer
(D) Glucose → (in cytoplasm) Pyruvate → (lack of oxygen) Lactic acid + Energy.

Q74 **Multiple Choice** · 1 mark ★ 1 paper

What is the by-product of aerobic respiration?

(a) carbon dioxide and water
(b) oxygen and glucose
(c) ATP and lactic acid
(d) ethanol and carbon dioxide

Source: KV Sitapur Periodic Test-2 2024-25 Q4 [FM p1]

✔ Answer
(A) Carbon dioxide and water.

Q75 **Multiple Choice** · 1 mark ★ 1 paper

Which row in the table below shows the correct products of anaerobic respiration in humans and in yeast?
(columns: humans–lactic acid | humans–carbon dioxide | yeast–lactic acid | yeast–carbon dioxide)
1: ✗ ✓ ✗ ✗ 2: ✓ ✗ ✗ ✓ 3: ✗ ✓ ✓ ✗ 4: ✓ ✓ ✓ ✗

(a) Row 1
(b) Row 2
(c) Row 3
(d) Row 4

	humans lactic acid	humans carbon dioxide	yeast lactic acid	yeast carbon dioxid
1	X	√	X	X
2	√	X	X	√
3	X	√	√	X
4	√	√	√	X

Figure from the question paper

Source: CBSE competency item bank — Life Processes Q5 [F4 p721]

✔ Answer
Row 2 — humans: lactic acid only; yeast: ethanol and carbon dioxide (no lactic acid).

Q76 **Multiple Choice** · 1 mark ★ 1 paper

The energy-rich compound produced through respiration is

(a) ADP
(b) Pyruvic acid
(c) AMP
(d) ATP

Source: Sample Question Paper-3 (2024-25) Q8 [F8 p2]

✔ Answer
(d) ATP.

Assertion–Reason · 1 question

Q77 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : The anaerobic respiration which takes place in yeast, has one of the end products as an acid.
Reason (R) : During anaerobic respiration, there is incomplete breakdown of glucose.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2023 · 31/1/2 Q18 [F1 p130]

✓ Answer
(d) A is false, but R is true. Yeast (fermentation) gives ethanol and carbon dioxide, not an acid.

Very Short Answer · 2 questions

Q78 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

With the help of a schematic flow chart, show the breakdown of glucose in a cell to provide energy — (i) in the presence of oxygen (ii) in lack of oxygen.

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.8 — break-down of glucose by various pathways.

Source: CBSE 2023 · 31/1/1 Q23(b) [F1 p98]

✓ Answer
Glucose (6-carbon) → in cytoplasm → Pyruvate (3-carbon) + energy (1/2)
(i) Presence of oxygen, in mitochondria → carbon dioxide + water + energy (3-carbon broken fully) (1/2 + 1/2)
(ii) Lack of oxygen, in our muscle cells → lactic acid (3-carbon) + energy (1/2)

Q79 **Very Short Answer** · 2 marks ★ 1 paper

A student sets up the experiment to show that CO2 is released during respiration, but forgets to place the small test tube with KOH inside the flask. How will the result change? Explain.

Source: Practice sample paper Q22 [F4 p571; key p580]

✓ Answer
KOH absorbs the CO2 released by the germinating seeds, creating a partial vacuum so the water level in the bent tube rises (1). Without KOH the CO2 stays in the flask, so the water level in the delivery tube will not rise — we cannot show that CO2 is released (1).

Short Answer · 5 questions

Q80 **Short Answer** · 3 marks ★ Board ×2 2 papers

During respiration, glucose is broken down into pyruvate. State the end products formed from it on further breakdown, in each of the following cases :
(a) In yeast, in absence of oxygen.
(b) Lack of oxygen in muscles.
(c) In presence of oxygen in mitochondria.

Source: CBSE 2026 · 31/7/1 Q13 [F4 p37] | CBSE supplementary 31/S/1 Q29 ('end products of breakdown of pyruvate in yeast and muscle cells; part of the cell') (yr?) [F4 p226]

✓ Answer
(a) Ethanol + carbon dioxide + energy (1).
(b) Lactic acid + energy (1).
(c) Carbon dioxide + water + energy (1).

Q81 **Short Answer** · 3 marks ★ 2 papers

A student blows into a clear solution present in a test tube and sees that it turns cloudy.
(a) What is the most likely substance present in the test tube?
(b) What could be the aim of his experiment?
(c) What kind of respiration is shown in the experiment? Justify your answer.

Source: CBSE Competency Focused Practice Questions Q30 [F6] | Sample paper Q12 (lime water in test tube A — air blown from mouth contains CO2) [F5]
Also asked as: Bangalore Sahodaya PB-1 2025-26 Q16 OR (a): 'With the help of an experiment, prove that carbon dioxide is released during respiration.' [F5 p548]

✔ Answer
(a) Lime water / calcium hydroxide solution (1).
(b) To show that carbon dioxide is released during respiration (1).
(c) Aerobic respiration (1/2) — CO2 is a product of aerobic respiration or fermentation, and fermentation does not take place in human cells (1/2).

Q82 **Short Answer** · 3 marks ★ Board ×1 1 paper

Write the main difference between aerobic and anaerobic respiration. State the pathway which is common for both. Write the overall chemical equation of aerobic respiration and mention the site where this process occurs inside the cells.

Source: CBSE 2024 · 31/3/2 Q30 [F1 p311]
Also asked as: Sample Question Paper-5 (2024-25) Q23 OR: 'How does aerobic respiration differ from anaerobic respiration?' [F8 p37]; practice paper Q33 'three differences' [F4 p558]

✔ Answer
Aerobic respiration uses oxygen and releases much more energy with CO2 and water as products; anaerobic respiration occurs without oxygen, releases less energy, products ethanol + CO2 (yeast) or lactic acid (muscles) (1). Common pathway: breakdown of glucose (6-carbon) into pyruvate (3-carbon) in the cytoplasm (1/2). $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ + energy (1). Site: mitochondria (1/2).

Q83 **Short Answer** · 3 marks ★ Board ×1 1 paper

(a) (i) What is the first step in the breakdown of glucose during aerobic and anaerobic respiration? Where does it take place?
(ii) ATP is called the energy currency of the cell. Why?
(iii) What is meant by residual volume of air in a breathing cycle?

Source: CBSE 2023 · 31/2/1 Q29(a), 31/2/2 Q33(a) [F1 p194, 223]

✔ Answer
(i) Glucose (6-carbon) is broken into pyruvate (3-carbon) (1/2); in the cytoplasm (1/2).
(ii) The energy released in respiration is used to make ATP; ATP is broken down to release energy for all activities in the cell — used like money (1).
(iii) During breathing the lungs always contain a residual volume of air so that there is sufficient time for oxygen to be absorbed and carbon dioxide to be released (1).

Q84 **Short Answer** · 3 marks ★ Board ×1 1 paper

(a) (i) State the role of ATP in cellular respiration.
(ii) What ensures sufficient exchange of gases in plants?
(iii) State the conditions on which the direction of diffusion of gases in plant depend upon.
OR
(b) (i) What is the internal energy reserve in plants and animals?
(ii) How do desert plants perform photosynthesis if their stomata remain closed during the day?

Source: CBSE 2023 · 31/1/1 Q29, 31/1/2 Q31, 31/1/3 Q30 [F1 p168]

✔ Answer
(a)(i) Energy released in respiration is stored as ATP, which is used to fuel all other activities in the cell (1). (ii) Large inter-cellular spaces ensure all cells are in contact with air; stomata (1). (iii) Environmental conditions and the requirement of the plant — at night CO2 is given out; in the day CO2 released in respiration is used in photosynthesis, so oxygen is given out (1).
OR (b)(i) Plants: starch; animals: glycogen (1). (ii) They take up CO2 at night and store it as an intermediate; in the day the stored CO2 is used for photosynthesis with energy absorbed by chlorophyll (2).

Long Answer · 1 question

Q85 **Long Answer** · 5 marks ★ Board ×1 1 paper

Study the following flow chart showing the breakdown of glucose by various pathways. In this flow chart, in four blocks some blanks are given as (A), (B), (C) and (D).
(i) Write the names of (A), (B), (C) and (D).
(ii) Write the source of glucose molecule involved in cellular respiration in (I) plants, and (II) animals.
(iii) Why do athletes sometimes suffer from muscle cramps during running?
(iv) Give reason why the rate of breathing in aquatic organisms is faster than in terrestrial organisms.

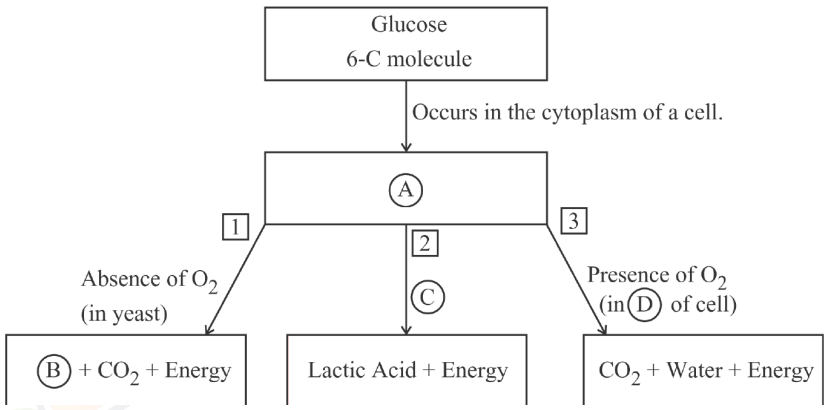


Figure from the question paper

Source: CBSE supplementary 31/S/3 Q35(a) (yr?) [F4 p317]

✔ Answer
(i) (A) Pyruvate (3-carbon molecule); (B) Ethanol; (C) Lack of oxygen (in our muscle cells); (D) Mitochondria (2).
(ii) (I) Plants — photosynthesis; (II) animals — digestion of food/carbohydrates (1).
(iii) Lack of oxygen in muscles → pyruvate converted to lactic acid; its build-up causes cramps (1).
(iv) The amount of dissolved oxygen in water is fairly low compared with air (1).

Case/Source-based · 1 question

Q86 **Case/Source-based** · 4 marks ★ 1 paper

Ravi went for a 5 km run early in the morning. After the run, he was breathing heavily and felt energetic.
(A) Why did Ravi start breathing heavily after the run? Name the type of respiration involved during intense physical activity.
OR
Why do muscle cells sometimes perform anaerobic respiration even in the presence of oxygen during vigorous exercise?
(B) Which energy carrying molecule is produced during respiration? Where is it produced in the cell?
(C) The figure shows parts of the human respiratory system. Which part is responsible for carrying air from the nasal passage to the lungs?

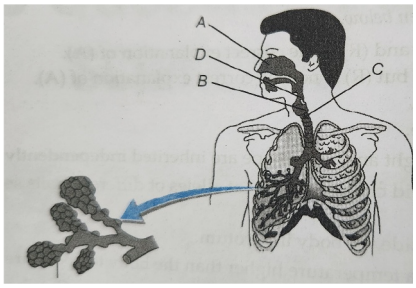


Figure from the question paper

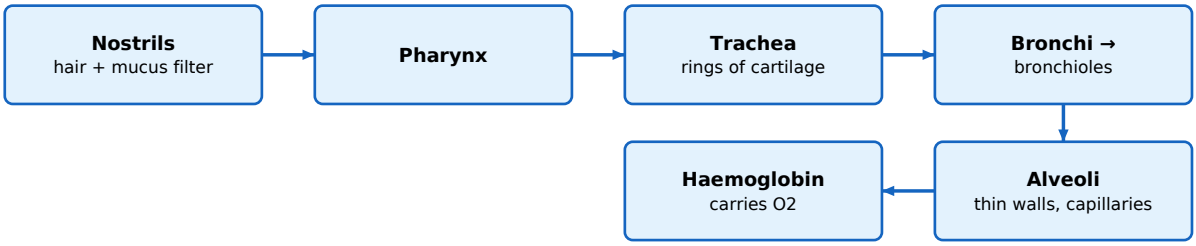
Source: KVS Lucknow Pre-board 2025-26 Q15 [FM p73]

✔ Answer
(A) Muscles needed more oxygen and had to remove extra carbon dioxide / lactic acid, so breathing rate increased; anaerobic respiration (in muscles) (2). OR Oxygen supply cannot keep pace with the high demand of energy, so pyruvate is converted to lactic acid (2).
(B) ATP; in mitochondria (and cytoplasm) (1).
(C) Trachea (wind-pipe) — the part labelled C (1).

Respiration · Human respiratory system and exchange of gases

19 questions · 23 appearances · 9 in board papers · Lungs, alveoli, haemoglobin, breathing rate in water, gas exchange in plants · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 6 questions

Q87 **Multiple Choice** · 1 mark ★ 2 papers

Haemoglobin and chlorophyll have similar structures. Haemoglobin is made of carbon, hydrogen, oxygen and nitrogen organised around iron; chlorophyll has the same elements organised around magnesium. Which element of haemoglobin is MOST LIKELY responsible for the red colour of our blood?

(a) hydrogen
(b) nitrogen
(c) carbon
(d) iron

Source: CBSE competency item bank — Life Processes Q2 [F4 p720] | KVS Lucknow 1 Pre-board Q9 (respiratory pigment in human body — haemoglobin) [FM p53]

✔ Answer
Iron (option 4).

Q88 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Choose the option that indicates the common structure between the basic filtration unit of kidneys and in the walls of alveoli of lungs.

(a) Thin-walled veins poorly supplied with blood.
(b) Thick-walled arteries richly supplied with blood.
(c) A cluster of thin-walled capillaries richly supplied with blood.
(d) Thick-walled capillaries poorly supplied with blood.

Source: CBSE VI 31(B) 2026 LMNK2 Q2 [F1 p59]

✔ Answer
(C) A cluster of thin-walled capillaries richly supplied with blood.

Q89 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

As compared to terrestrial organisms, the rate of breathing in aquatic organisms is :

(a) faster because they need more oxygen for their survival.
(b) faster because the amount of dissolved oxygen in water is fairly low.
(c) slower because the amount of dissolved oxygen in water is fairly low.
(d) slower because the capacity of water of dissolving atmospheric air is limited.

Source: CBSE 2023 · 31/5/1 Q9 [F1 p460]

✔ Answer
(b) faster because the amount of dissolved oxygen in water is fairly low.

Q90 **Multiple Choice** · 1 mark ★ 1 paper

Which of the following statement(s) is (are) true about respiration?
(i) During inhalation, ribs move inward and diaphragm is raised
(ii) In the alveoli exchange of gases takes place i.e. oxygen from alveolar air diffuses into blood and CO_2 from blood into alveolar air
(iii) Haemoglobin has greater affinity for carbon dioxide than oxygen
(iv) Alveoli increase surface area for exchange of gases

(a) (i) and (iv)
(b) (ii) and (iii)
(c) (i) and (iii)
(d) (ii) and (iv)

Source: Sample paper Q8 [F5 p14]

✔ Answer
(d) (ii) and (iv). During inhalation ribs are lifted and the diaphragm flattens; haemoglobin has high affinity for oxygen.

Q91 **Multiple Choice** · 1 mark ★ 1 paper

Smoking is likely to cause infections in the respiratory tract. Which statement best explains the fact?

(a) Smoking destroys the hair-like structures.
(b) Smoking causes excessive growth of the hair-like structures.
(c) Smoking stimulates the hair-like structures to release harmful chemicals.
(d) Smoking makes the hair-like structures wet and they fail to trap dust particles.

Source: CBSE–Sri Aurobindo Society competency items Ch 6 Q10 [F5 p407]

✔ **Answer**
(A) Smoking destroys the hair-like structures (which filter the inhaled air).

Q92 **Multiple Choice** · 1 mark ★ 1 paper

Which row of the table given below correctly gives the movement of gases across blood and cells?

(a) Row 1
(b) Row 2
(c) Row 3
(d) Row 4

	Oxygen	Carbon dioxide				
	from	**to**	**process**	**from**	**to**	**process**
1	RBC	cells	diffusion	cells	RBC	osmosis
2	RBC	cells	osmosis	cells	plasma	osmosis
3	RBC	cells	osmosis	cells	RBC	diffusion
4	RBC	cells	diffusion	cells	plasma	diffusion

Figure from the question paper

Source: CBSE competency item bank — Life Processes Q7 [F4 p722]

✔ **Answer**
Row 4 — oxygen moves from RBC to cells, and carbon dioxide from cells to plasma, both by diffusion.

Assertion–Reason · 3 questions

Q93 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : The rate of breathing in aquatic organisms is faster than that in terrestrial organisms.
Reason (R) : The amount of oxygen dissolved in pond/river water is comparatively higher than the amount of oxygen present in air.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE VI 31(B)/S EFGH/S Q19 (yr?) [F1 p40]

✔ **Answer**
(C) A is true, but R is false. Dissolved oxygen in water is fairly low compared with air.

Q94 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : The lungs always contain a residual volume of air.
Reason (R) : The respiratory pigment is haemoglobin which has high affinity with O2.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2026 · 31/7/2 Q9 [F4 p51]

✔ **Answer**
(B) Both true, but R is not the correct explanation — the residual volume gives sufficient time for oxygen to be absorbed and carbon dioxide to be released.

Q95 **Assertion-Reason** · 1 mark ★ 1 paper

Assertion (A): In plants there is no need of specialised respiratory organs.
Reason (R): Plants do not have great demands of gaseous exchange.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: KVS Raipur Region Pre-board 2025-26 Q18 [F5 p300; copy p306]

✔ **Answer**
(A) Both true and R explains A — each part of the plant takes care of its own gas exchange through stomata and lenticels by diffusion.

Very Short Answer · 4 questions

Q96 **Very Short Answer** · 2 marks ★ Board ×2 2 papers

Give reasons :
(a) During a breathing cycle, the lungs always contain a residual volume of air.
(b) As compared to oxygen, carbon dioxide is mostly transported in dissolved form in our blood.

Source: CBSE supplementary 31/S/1 Q23 (yr?) [F4 p224] | CBSE 2026 · 31/5/3 Q11 ('Why do the lungs always contain a residual volume of air?') [F4 p530]

✔ **Answer**
(a) So that there is sufficient time for oxygen to be absorbed and for carbon dioxide to be released (1).
(b) Carbon dioxide is more soluble in water than oxygen (1).

Q97 **Very Short Answer** · 2 marks ★ 2 papers

Why is diffusion insufficient to meet the oxygen requirements of multicellular organisms like humans?

Source: Sample Question Paper-6 (2024-25) Q23 [F8 p53] | CBSE competency item bank Q21 ('Why do multicellular animals need a respiratory pigment?') [F4 p728]

✔ **Answer**
In large multicellular organisms like humans, all body cells are not in direct contact with the air (1); diffusion is too slow — it would take about three years for oxygen to reach the toes from the lungs, so a respiratory pigment (haemoglobin) is needed (1).

Q98 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Write one important function each of the following in the human respiratory system :
(a) Rings of cartilage (b) Alveoli (c) Haemoglobin (d) Lining of mucus

Source: CBSE 2023 · 31/5/2 Q24 [F1 p495]

✔ Answer
(a) Ensure that the air-passage (throat) does not collapse. (b) Provide a large surface where exchange of gases takes place. (c) Takes up oxygen from air in the lungs and carries it to tissues. (d) Traps dust and germs, filtering inhaled air. (1/2 each)

Q99 **Very Short Answer** · 2 marks ★ 1 paper

How are the lungs designed in humans to maximize the area for exchange of gases?

Source: KVS Lucknow Pre-board-I 2023-24 Q26 [FM p43]

✔ Answer
The air passage divides into smaller tubes that finally end in balloon-like structures called alveoli (1). The alveoli provide a very large surface for exchange of gases and their walls have an extensive network of blood vessels (1).

Short Answer · 4 questions

Q100 **Short Answer** · 3 marks ★ Board ×2 2 papers

(i) List any two characteristics of lungs which make them an efficient respiratory system.
(ii) Name the part of human respiratory system :
(1) where air is filtered by fine hair and mucus lining.
(2) which separates chest cavity from abdominal cavity.
(3) which has balloon like structures where exchange of gases takes place.
(4) two large air passages which connect trachea to lungs.

Source: CBSE VI 31(B)/S CDBA/S Q29(a) (yr?) [F1 p15] | CBSE 2023 · 31/2/3 Q29(b) [F1 p248]

✔ Answer
(i) Large number of alveoli give a very large surface area; alveolar walls are thin and richly supplied with blood capillaries (1/2 + 1/2).
(ii) (1) Nostrils/nasal passage (2) Diaphragm (3) Alveoli (4) Bronchi (1/2 each).

Q101 **Short Answer** · 3 marks ★ Board ×1 1 paper

Give reason for each of the following :
(i) Alveoli in lungs are richly supplied with blood capillaries.
(ii) Respiratory pigment in the blood takes up oxygen and not carbon dioxide gas.
(iii) During anaerobic respiration, a 3-carbon molecule is formed as an end product instead of CO_2 in human beings.

Source: CBSE VI 31(B)/S EFGH/S Q29(b) (yr?) [F1 p44]

✔ Answer
(i) So that oxygen from the alveolar air can diffuse into blood and carbon dioxide from blood into alveolar air quickly (1).
(ii) Haemoglobin has a very high affinity for oxygen; carbon dioxide is more soluble in water and is mostly carried in dissolved form in blood (1).
(iii) In lack of oxygen in muscle cells, pyruvate is converted into lactic acid (a 3-carbon molecule); it is not broken down further to CO_2 (1).

Q102 **Short Answer** · 3 marks ★ 1 paper

Terrestrial animals use lungs to breathe while aquatic animals like fishes use gills to absorb dissolved oxygen in water. Frogs can survive both in water and on land.
(a) How does a frog acquire oxygen while it is underwater?
(b) Are lungs of terrestrial animals and gills of fishes analogous organs? Explain.
(c) Why do aquatic animals have a higher breathing rate than terrestrial animals?

Source: CBSE competency item bank — Life Processes Q16 [F4 p726]

✔ Answer
(a) Through its thin, moist skin — dissolved oxygen diffuses in (1).
(b) Yes (functionally) — both do the same job of exchange of gases but have different structure and origin (1).
[Analogous organs are out of the 2026-27 syllabus — attempt only as a general idea.]
(c) Amount of dissolved oxygen in water is fairly low compared with air (1).

⚠ **Note:** Part (b) touches analogous organs (evolution — removed). Teacher may skip (b).

Q103 **Short Answer** · 3 marks ★ 1 paper

Draw a diagram of human respiratory system and label — pharynx, trachea, diaphragm and alveolar sac on it.

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.9 Human respiratory system.

Source: KVS Lucknow Pre-board-II 2023-24 Q29 OR [FM p37]

✔ Answer
Labelled diagram (NCERT Fig. 5.9) with the four labels (1/2 each for labels + 1 for diagram).

Long Answer · 2 questions

Q104 **Long Answer** · 5 marks ★ Board ×1 1 paper

(i) State the role of rings of cartilage present in the throat.
(ii) Discuss the role of the ribs and diaphragm when air is taken in during the breathing cycle.
(iii) Why do we get muscle cramps during heavy exercise? Explain.

Source: CBSE 2025 · 31/2/3 Q36(b) [F9/F2/F3]

✔ Answer
(i) Rings of cartilage ensure that the air-passage does not collapse (1).
(ii) When we breathe in, we lift our ribs and flatten our diaphragm; the chest cavity becomes larger, air is sucked into the lungs and fills the expanded alveoli (2).
(iii) During heavy exercise oxygen supply to muscle cells becomes short; pyruvate is converted into lactic acid (anaerobic respiration); build-up of lactic acid causes cramps (2).

Q105 **Long Answer** · 5 marks ★ 1 paper

Aerobic respiration requires intake of oxygen to break down food to release energy.
(a) Name the structures through which gaseous exchange takes place in plants and human beings.
(b) Name the structure that controls the size of the chest cavity in humans to facilitate exchange of gases.
(c) What is the process by which gas exchange occurs in plants?
(d) Why is the process named in (c) not sufficient to carry oxygen throughout human body? How is this complemented in humans?
(e) State whether heat energy is absorbed/released during digestion. Also write the scientific term.

Source: CBSE Competency Focused Practice Questions Q29 [F6]

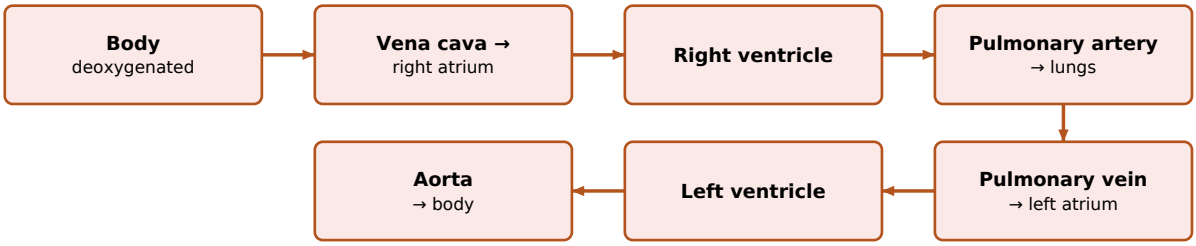
✔ Answer
(a) Plants: stomata; humans: alveoli/lungs (1). (b) Diaphragm (1/2). (c) Diffusion (1/2). (d) Diffusion is slow and the body is large and complex, so oxygen cannot reach all cells by diffusion alone (1); oxygen is carried by haemoglobin in blood (1). (e) Digestion of food is a decomposition (breakdown) reaction; heat is absorbed — endothermic (as per the key) (1).

⚠ **Note:** Part (e): CFPQ key says 'endothermic'. NCERT Ch 1 treats respiration as exothermic; digestion as a decomposition — keep the key's answer but discuss in class.

Transportation · Human heart and double circulation

20 questions · 32 appearances · 13 in board papers · Four chambers, valves, oxygenated/deoxygenated blood, double circulation · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 7 questions

Q106 Multiple Choice · 1 mark ★ Board ×2 2 papers

Select the correct statements from the following about the human heart :
(i) Right atrium receives oxygenated blood from lungs through pulmonary artery.
(ii) Right atrium receives deoxygenated blood through vena cava from upper and lower body.
(iii) Left atrium transfers oxygenated blood to left ventricle which sends it to various parts of the body.
(iv) Left atrium transfers oxygenated blood to aorta which sends it to various parts of the body.

(a) (i) and (ii)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iv)

Source: CBSE VI 31(B)/S EFGH/S Q8 (yr?) [F1 p34] | CBSE 2024 · 31/3/1 Q11 [F1 p267], 31/3/2 Q12 [F1 p301], 31/3/3 Q8 [F1 p331]

✔ **Answer**
(B) (ii) and (iii). [In the 2024 papers the same statements are lettered (a)–(d); correct answer there: (b) and (c) → option (C).]

Q107 Multiple Choice · 1 mark ★ Board ×2 2 papers

The valves in the human heart ensure that
(i) Oxygen-rich blood flows from left atrium to left ventricle only.
(ii) Deoxygenated blood flows from left atrium to left ventricle only.
(iii) Oxygen-rich blood flows from right atrium to right ventricle only.
(iv) Deoxygenated blood flows from right atrium to right ventricle only.

(a) (i) and (iii)
(b) (ii) and (iv)
(c) (i) and (iv)
(d) (ii) and (iii)

Source: CBSE supplementary 31/S/1 Q6 (yr?) [F4 p218] | CBSE supplementary 31/S/3 Q6 (yr?) [F4 p330]

✔ **Answer**
(C) (i) and (iv).

Q108 Multiple Choice · 1 mark ★ Board ×1 1 paper

Given below a set of statements regarding blood circulation in humans. Identify the correct statement.

(a) Oxygenated blood from lungs comes to the right auricle through pulmonary veins.
(b) Vena cavas take oxygenated blood from body parts to right auricle.
(c) Pulmonary artery takes oxygenated blood from heart to lungs.
(d) Aorta takes oxygenated blood from heart to body parts.

Source: CBSE VI 31(B) 2026 LMNK2 Q3 [F1 p59]

✔ **Answer**
(D) Aorta takes oxygenated blood from heart to body parts.

Q109 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Select the correct option from the following statements about the functioning of the human heart.

(a) Right atrium receives deoxygenated blood from different parts of the body and sends it to pulmonary veins.
(b) Left atrium sends oxygenated blood to right ventricle which pumps it to different parts of the body.
(c) Right atrium receives deoxygenated blood from the body and sends it to the right ventricle.
(d) Left atrium receives oxygenated blood from the pulmonary arteries and sends it to the left ventricle.

Source: CBSE 2025 · 31/2/3 Q6 [F9/F2/F3]

✔ **Answer**
(C) Right atrium receives deoxygenated blood from the body and sends it to the right ventricle.

Q110 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Select the correct option that shows the path of flow of only the deoxygenated blood through the human circulatory system.

(a) Body → left atrium → left ventricle → lungs → right atrium → right ventricle → body
(b) Right atrium → right ventricle → lungs → left atrium → left ventricle → body
(c) Body → left atrium → left ventricle → lungs
(d) Body → right atrium → right ventricle → lungs

Source: CBSE 2026 · 31/8/2 [F4 p127]

✔ **Answer**
(D) Body → right atrium → right ventricle → lungs.

Q111 **Multiple Choice** · 1 mark ★ 1 paper

During which of the following stages of the circulation of blood in a normal human being, the oxygenated blood is pumped to all parts of the body?

(a) Contraction of left atrium
(b) Contraction of left ventricle
(c) Relaxation of right atrium
(d) Relaxation of right ventricle

Source: KVS Lucknow Pre-board-2 2024-25 Q10 [FM p21]

✔ **Answer**
(B) Contraction of left ventricle.

Q112 **Multiple Choice** · 1 mark ★ 1 paper

Which two chambers of the human heart have arteries connected to them?

(a) left atrium and left ventricle
(b) right atrium and right ventricle
(c) left atrium and right atrium
(d) left ventricle and right ventricle

Source: CBSE Competency Focused Practice Questions Q28 [F6]

✔ **Answer**
(D) left ventricle and right ventricle — aorta and pulmonary artery.

Assertion–Reason · 6 questions

Q113 **Assertion–Reason** · 1 mark ★ Board ×1 2 papers

Assertion (A) : Mammals and birds have efficient supply of oxygen to the body.
Reason (R) : Mammals and birds have four-chambered heart.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE VI 31(B) 2026 LMNK2 Q8 [F1 p63] | CBSE competency item bank Q1 (warm-blooded animals — heart separated; R: high energy to maintain body temperature — key (A)) [F4 p720]

✔ Answer
(A) Both true and R explains A — the four-chambered heart keeps oxygenated and deoxygenated blood separate.

Q114 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : Left atrium receives oxygenated blood from pulmonary vein.
Reason (R) : Right atrium transfers deoxygenated blood to the right ventricle, which pumps it to the lungs for oxygenation.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2023 · 31/1/3 Q20 [F1 p162]

✔ Answer
(b) Both true, but R is not the correct explanation of A.

Q115 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : In the human heart ventricles have thicker muscular walls than atria.
Reason (R) : Ventricles have to pump the blood into various organs.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2024 · 31/4/1 Q18 (D4CBA/4) [F1 p389]

✔ Answer
(A) Both true and R explains A.

Q116 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : The walls of atria are thicker than those of the ventricles.
Reason (R): Ventricles have to pump blood into various organs at high pressure.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2023 · 31/5/1 Q19 [F1 p464], 31/5/2 Q18 [F1 p493], 31/5/3 Q20 [F1 p522]

✔ Answer
(D) A is false, but R is true — ventricles have thicker walls than atria.

Q117 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion : In human heart there is no mixing of oxygenated and deoxygenated blood.
Reason : Valves are present in the heart which allow the movement of blood in one direction only.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: KV Sitapur PT-I 2023 Q4 [FM p12]

✔ Answer
(b) Both true, but R is not the correct explanation — mixing is prevented because the right and left sides are separated (septum); valves only prevent backflow.

Q118 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion : Amphibians can tolerate mixing of oxygenated and deoxygenated blood.
Reason : Amphibians are animals with two chambered heart.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: KVS Lucknow 1 Pre-board Q19 [FM p55]

✔ Answer
(C) A is true, but R is false — amphibians have a three-chambered heart (fishes have two).

Very Short Answer · 5 questions

Q119 **Very Short Answer** · 2 marks ★★★ Board ×3 8 papers

Briefly mention the steps in double circulation through human heart.

▣ **Diagram to draw / re-drawn:** Picture it: double circulation flow chart (drawn below).

Source: CBSE 2026 · 31/5/1 Q12 [F4 p468], 31/5/2 [F4 p500], 31/5/3 [F4 p530] | CBSE 2026 · 31/4/2 Q14(b) ('Why do mammals and birds have double circulation?') [F4 p406] | CBSE 2023 · 31/4/1 Q29(B) [F1 p369], 31/4/2 Q31(B) [F1 p420] (3 m: double circulation + why separation of right and left side is useful) | KVS Lucknow 1st Pre-board 2022-23 Q25 [FM p17] | KVS Lucknow 1 Pre-board Q29 (3 m) [FM p56] | KVS Lucknow Pre-board-I 2023-24 Q30 (3 m, flow chart) [FM p44] | KV Sitapur PT-I 2023 Q8(b) [FM p13] | KVS Lucknow Pre-board 2025-26 Q11 (pulmonary vs systemic circulation) [FM p80]
Also asked as: Sample Question Paper-5 (2024-25) Q23 [F8 p37]; practice paper Q41 'pathway of oxygen-rich and oxygen-poor blood' [F4 p672]

✔ Answer
Blood passes through the heart twice in one cycle (1/2). Oxygen-rich blood from lungs → left atrium → left ventricle → aorta → body (1/2). Deoxygenated blood from body → vena cava → right atrium → right ventricle → pulmonary artery → lungs (1/2). This keeps oxygenated and deoxygenated blood separate — efficient supply of oxygen (1/2).

Q120 **Very Short Answer** · 2 marks ★★ Board ×2 3 papers

(a) Why is it important to prevent oxygenated and deoxygenated blood from mixing in birds and mammals?
(b) Which animals can tolerate some mixing of the oxygenated and deoxygenated blood streams? On what factor does the body temperature of these animals depend?

Source: CBSE 2023 · 31/2/1 Q22 [F1 p190] | CBSE 2023 · 31/5/2 Q23 [F1 p495] | Practice sample paper Q23 ('In mammals separation ... is necessary. Why?') [F4 p569]

✔ Answer
(a) Separation allows a highly efficient supply of oxygen to the body; birds and mammals need high energy to maintain their body temperature (1).
(b) Amphibians and many reptiles (1/2); their body temperature depends on the temperature of the environment (1/2).

Q121 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Name the type of blood (oxygenated / deoxygenated) transported by each of the following mentioning the path (i.e. from one organ (which place) to another (which place)) : (i) Vena cava (ii) Pulmonary artery

Source: CBSE 2023 · 31/1/1 Q23(a) [F1 p98]

✔ Answer
(i) Vena cava — deoxygenated blood from different parts of the body to the right atrium of the heart (1).
(ii) Pulmonary artery — deoxygenated blood from the right ventricle of the heart to the lungs (1).

Q122 **Very Short Answer** · 2 marks ★ 1 paper

Trace the movement of oxygenated blood in the body.

Source: KVS Lucknow Monthly Exam Oct 2024-25 Q10 [FM p4]

✔ Answer
Lungs → pulmonary veins → left atrium → left ventricle → aorta → arteries → capillaries in all body parts/organs (2).

Q123 **Very Short Answer** · 2 marks ★ 1 paper

How many chambers are there in the heart of the following organisms? How is mixing of oxygenated and deoxygenated blood prevented in their body?
(i) Fishes (ii) Humans

Source: CBSE SQP 2025-26 Q11(A) [F8 p305]

✔ Answer
(i) Two chambers; blood is pumped to the gills, oxygenated there and passes directly to the rest of the body (1).
(ii) The four chambers with the septum separating right and left sides prevent mixing of oxygenated and deoxygenated blood — efficient oxygen supply for high energy needs (1).

Short Answer · 2 questions

Q124 **Short Answer** · 3 marks ★ Board ×1 1 paper

Name the blood vessel that brings (i) oxygenated blood (ii) deoxygenated blood, to the human heart. Also name that chamber of the heart which receives deoxygenated blood and state how deoxygenated blood from this chamber is sent to lungs for oxygenation.

Source: CBSE 2025 · 31/6/3 Q31 [F4 p21]

✔ Answer
(i) Pulmonary vein (1/2). (ii) Vena cava (1/2). Right atrium receives deoxygenated blood (1/2); when it contracts, blood goes to the right ventricle, which contracts and pumps it through the pulmonary artery to the lungs (1 1/2).

Q125 **Short Answer** · 3 marks ★ 1 paper

(a) Draw the diagram of human heart and label any four parts.
(b) What is double circulation? Define it.

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.10 Schematic sectional view of the human heart.

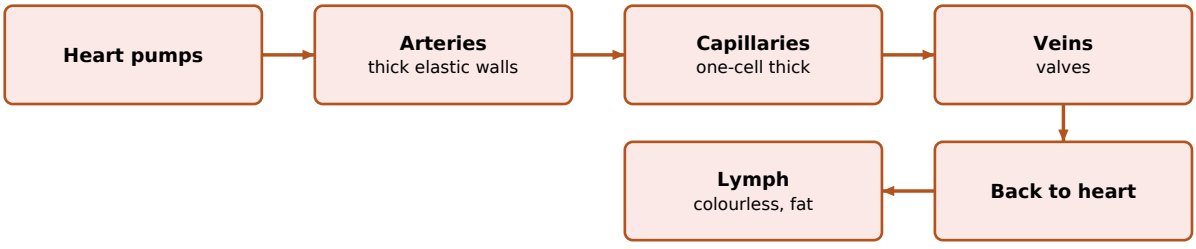
Source: KV Sitapur PT-I 2023 Q8 [FM p12–13]

✔ Answer
(a) Diagram (NCERT Fig. 5.10) with any four: right atrium, left atrium, right ventricle, left ventricle, aorta, pulmonary artery, pulmonary veins, vena cava (2).
(b) Blood goes through the heart twice during each cycle in a vertebrate — once to the lungs and once to the body (1).

Transportation · Blood vessels, blood and lymph

11 questions · 11 appearances · 4 in board papers · Arteries, veins, capillaries, platelets, lymph · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 4 questions

Q126 **Multiple Choice** · 1 mark ★ Board ×1 2 papers

One-cell thick blood vessels are known as :

(a) Alveoli
(b) Capillaries
(c) Arteries
(d) Veins

Source: CBSE 2025 · 31/2/1 Q7, 31/2/3 Q8 [F9/F2/F3] | CBSE Competency Focused Practice Questions Q25 (Malpighi found — capillaries) [F6]

✔ Answer
(B) Capillaries.

Q127 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

'The lymph is colourless tissue fluid.' This indicates that it lacks (i) cells and hence cannot carry (ii). Choose the option that correctly identifies (i) and (ii).

(a) (i) Platelets (ii) excess fluid
(b) (i) Red blood (ii) oxygen
(c) (i) Red blood (ii) fats
(d) (i) White blood (ii) salts

Source: CBSE 2026 · 31/8/2 [F4 p125]

✔ Answer
(B) (i) Red blood cells (ii) oxygen.

Q128 **Multiple Choice** · 1 mark ★ 1 paper

Which of the following statements about arteries and veins is TRUE?

(a) Arteries have thicker walls than veins.
(b) Veins have thicker walls than arteries.
(c) All arteries carry only oxygenated blood.
(d) All veins carry only deoxygenated blood.

Source: CBSE Competency Focused Practice Questions Q27 [F6]

✔ Answer
(A) Arteries have thicker walls than veins — blood in arteries is under high pressure.

Q129 **Multiple Choice** · 1 mark ★ 1 paper

Which of these will be the immediate effect if gaseous exchange in the lung capillaries reduces?

(a) Blood will flow in the reverse direction.
(b) Pulmonary veins will receive blood with less oxygen.
(c) The space inside the left and the right atrium will increase.
(d) The pressure of blood inside the capillaries will decrease.

Source: CBSE–Sri Aurobindo Society competency items Ch 6 Q7 [F5 p406]

✔ Answer
(B) Pulmonary veins will receive blood with less oxygen.

Assertion–Reason · 1 question

Q130 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A) : Blood clotting prevents excessive loss of blood.
Reason (R) : Blood clotting is due to blood plasma and white blood cells present in the blood.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2023 · 31/1/1 Q19 [F1 p96]

✔ **Answer**
(c) A is true, but R is false — clotting is due to platelets.

Very Short Answer · 3 questions

Q131 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

What will happen if :
(a) Xylem tissue in a plant is removed ?
(b) We are injured and start bleeding ?

Source: CBSE 2023 · 31/2/2 Q22 [F1 p219]

✔ **Answer**
(a) Water and minerals will not be transported from roots to leaves; the plant will wilt, photosynthesis will stop (1).
(b) Platelets circulating in the blood plug the leak by helping the blood to clot at the injury, preventing further loss of blood (1).

Q132 **Very Short Answer** · 2 marks ★ 1 paper

What would be the consequence of a deficiency of haemoglobin in our body?
OR
What is meant by circulation?

Source: Sample Question Paper-4 (2024-25) Q23 [F8 p21]

✔ **Answer**
Haemoglobin carries oxygen; its deficiency (anaemia) means blood cannot carry enough oxygen, so less energy is released in cells — the person feels tired and breathless (2).
OR Continuous movement of blood through the heart and blood vessels to carry food, oxygen and wastes to and from all parts of the body (2).

Q133 **Very Short Answer** · 2 marks NEW

Why do arteries have thick elastic walls while veins have valves?

Source: NEW — NCERT 5.4.1

✔ **Answer**
Arteries carry blood away from the heart under high pressure, so they have thick, elastic walls (1). Blood in veins is no longer under pressure; valves ensure that blood flows only in one direction (towards the heart) (1).

Short Answer · 2 questions

Q134 **Short Answer** · 3 marks ★ 1 paper

How is lymph an important fluid involved in transportation? Give two points of difference between blood and lymph.

Source: KVS Lucknow Pre-board-II 2023-24 Q29 [FM p37]

✔ Answer
Lymph (tissue fluid) escapes from capillaries into intercellular spaces, drains into lymphatic capillaries and returns to blood; it carries digested and absorbed fat from the intestine and drains excess fluid back into blood (1).
Differences: blood is red, has RBCs; lymph is colourless with less protein and no RBCs; blood flows in blood vessels, lymph in lymphatic vessels (1 + 1).

Q135 **Short Answer** · 3 marks ★ 1 paper

(a) Sometimes doctors inject medicines directly in our bloodstream. Where do they inject — in arteries or in veins? Why?
(b) What will happen if there are no platelets in the blood?

Source: Bangalore Sahodaya PB-1 2024-25 Q30 OR [F5 p8]

✔ Answer
(a) In veins (1/2) — veins are near the surface, have thin walls and blood in them is not under high pressure, so the medicine goes with the blood to the heart and then to all parts (1).
(b) Blood will not clot at an injury, so there will be excessive loss of blood (1 1/2).

Case/Source-based · 1 question

Q136 **Case/Source-based** · 4 marks ★ 1 paper

Besides heart, the human circulatory system consists of a network of closed branching blood vessels and the blood that circulates continuously in all parts of the body. The heart has four chambers — two atria and two ventricles. The right side is separated from the left side by a dividing wall, the septum.
(a) Name the smallest blood vessel and state its role in the circulation of blood.
(b) Write the importance of platelets in the human blood.
(c) (i) Write in tabular form, two differences between an artery and a vein.
OR
(ii) Why is blood circulation in the human heart called double circulation? Explain.

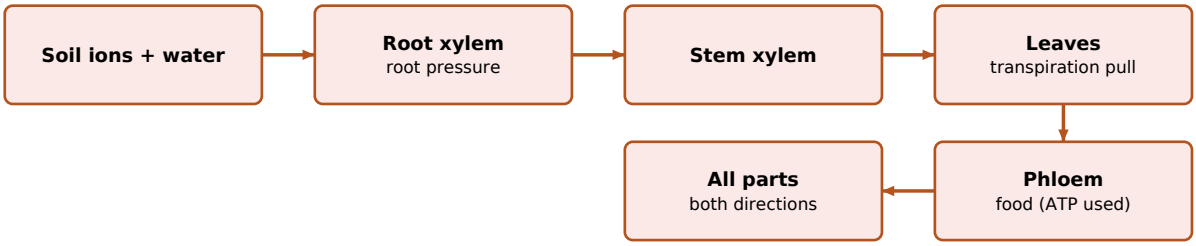
Source: KVS paper (8-page, Page 3 of 8) Q15 [F9]

✔ Answer
(a) Capillary; its walls are one-cell thick so exchange of materials between blood and surrounding cells takes place (1).
(b) Platelets help blood to clot at the point of injury and prevent loss of blood (1).
(c)(i) Artery: carries blood from heart to organs, thick elastic walls. Vein: collects blood from organs and brings it back to heart, thin walls, valves (2).
OR (ii) Blood passes through the heart twice in each cycle — heart → lungs → heart (pulmonary) and heart → body → heart (systemic) (2).

Transportation · Transportation in plants

10 questions · 16 appearances · 8 in board papers · Xylem, root pressure, transpiration, translocation in phloem · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 3 questions

Q137 **Multiple Choice** · 1 mark ★ Board ×1 2 papers

Water in the root enters due to :

(a) the function of the root to absorb water.
(b) difference in the concentration of ions between the root and the soil.
(c) excess water present in the soil.
(d) diffusion of water in the roots.

Source: CBSE 2023 · 31/4/3 Q9 [F1 p434] | KVS Lucknow Pre-board Q15 ('roots absorb water through' — osmosis) [FM p48]

✔ Answer
(b) difference in the concentration of ions between the root and the soil — root cells take up ions actively, so water moves in.

Q138 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Observe the following diagram and identify the process and its significance from the following options :

(a) Evaporation : maintains water contents in leaf cells.
(b) Transpiration : creates a suction force which pulls water inside the plant.
(c) Excretion : helps in excreting out waste water from the plant.
(d) Translocation : helps in transporting materials from one cell to another.

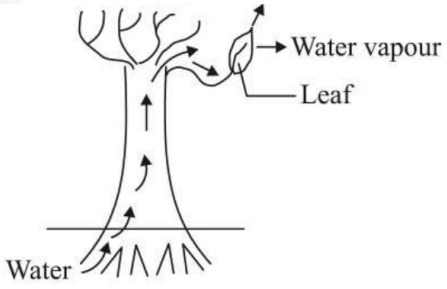


Figure from the question paper

Source: CBSE 2023 · 31/4/1 Q8 [F1 p359]

✔ Answer
(b) Transpiration : creates a suction force which pulls water inside the plant.

Q139 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

The process in which loss of water in the form of vapours from the aerial parts of plants takes place is X, which helps in Y. Here X and Y respectively are :

(a) transpiration and photosynthesis.
(b) transpiration and temperature regulation.
(c) translocation and movement of soluble products of photosynthesis in phloem.
(d) translocation and absorption of water and minerals from soil by roots.

Source: CBSE 2023 · 31/5/1 Q8 [F1 p460]

✔ Answer
(b) transpiration and temperature regulation.

Assertion-Reason · 1 question

Q140 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Xylem tissue moves water and minerals obtained from the soil by the roots.
Reason (R): Xylem tissue is found only in the roots of a plant.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: CBSE 2025 · 31/6/3 Q17 [F4 p13]

✔ Answer
(C) A is true, but R is false — xylem of roots, stems and leaves is interconnected.

Very Short Answer · 4 questions

Q141 **Very Short Answer** · 2 marks ★★ Board ×1 4 papers

Explain how transportation of water in xylem differs from transportation of food in phloem.

Source: KVS Lucknow Pre-board-II 2023-24 Q23 [FM p37] | KVS Delhi Pre-board-II 2024-25 Q23 [FM p89] | KVS Lucknow 1 Pre-board Q29 OR (3 m) [FM p56] | CBSE supplementary 31/S/1 Q30(b) [F4 p228], 31/S/2 [F4 p286], 31/S/3 [F4 p338] (3 m: direction, driving force, substance) (yr?)

✔ Answer
Xylem: water and minerals move upward (one direction) from roots to leaves (1/2); driven by root pressure and transpiration pull — no energy from ATP (1/2).
Phloem: food moves in both directions (up and down) from leaves to other parts (1/2); uses energy from ATP (1/2).

Q142 **Very Short Answer** · 2 marks ★ Board ×1 2 papers

Photosynthesis takes place in the leaves of a plant and the food prepared by the leaves reaches other parts of the plant. Name and explain the process involved in the phenomenon.

Source: CBSE VI 31(B)/S EFGH/S Q22 (yr?) [F1 p42] | KVS Lucknow Monthly Exam Oct 2024-25 Q10 OR [FM p4]
Also asked as: CBSE supplementary 31/S/1 Q30(a): 'Explain the process of translocation of food and other substances in the phloem of plants.' (3 m) [F4]

✔ Answer
Translocation (1/2). Soluble products of photosynthesis are transported through phloem, mainly in the sieve tubes, with the help of companion cells (1/2). Material like sucrose is moved into phloem using energy from ATP; this raises osmotic pressure, water enters and the pressure moves the material to tissues with less pressure (1).

Q143 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

"Transpiration in plants is a necessary evil." Comment on the statement giving two reasons.

Source: CBSE 2026 · 31/4/2 Q11 [F4 p404]

✔ Answer
Evil: a lot of water absorbed by the plant is lost as vapour from the leaves (1). Necessary: transpiration pull helps in absorption and upward movement of water and minerals from roots to leaves, and helps in temperature regulation (1).

Q144 **Very Short Answer** · 2 marks ★ 1 paper

Sanjeev covered a potted plant with a plastic bag to check whether plant leaves release water vapour. How does the loss of water by plant leaves help the plant? Mention two points.

Source: CBSE–Sri Aurobindo Society competency items Ch 6 Q5 [F5 p405]

✔ Answer
Helps the plant absorb water and minerals from the soil and move them upward (1). Helps the plant control its temperature (1).

Short Answer · 2 questions

Q145 **Short Answer** · 3 marks ★★ Board ×1 3 papers

We water the soil but it reaches the topmost leaves of the plants. Explain in brief the process involved.

Source: CBSE 2024 · 31/3/1 Q29, 31/3/3 Q29 [F1 p277, 343] | CBSE SQP 2025-26 Q11(B) ('Explain the mechanism by which the water is transported in plants') [F8 p305] | Sample paper Q29 (key: transpiration pull) [F6]

✔ Answer
Root cells take up ions from the soil, creating a difference in concentration; water moves into the root xylem (root pressure) (1). Xylem vessels and tracheids of roots, stems and leaves form a continuous system of water-conducting channels (1). Water evaporating from leaves through stomata (transpiration) creates a suction which pulls water up from the roots to the top — transpiration pull is the main driving force in the day (1).

Q146 **Short Answer** · 3 marks NEW

Why is transport of water in a tall tree not possible by diffusion? Name the tissues for transport in plants and the materials each carries.

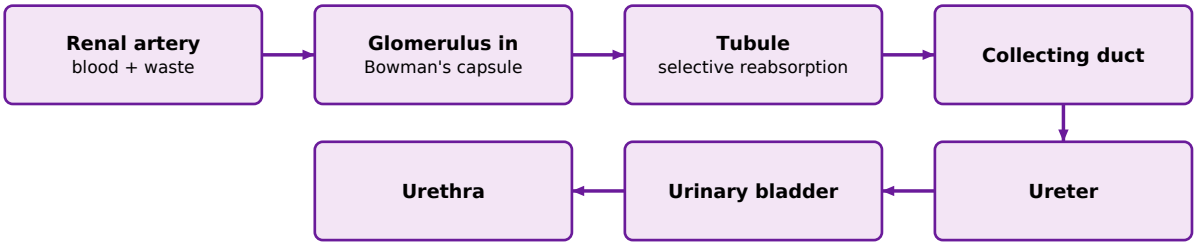
Source: NEW — NCERT 5.4.2

✔ Answer
Diffusion is too slow to move water over large distances in a tall plant (1). Xylem moves water and minerals from the soil (1). Phloem transports products of photosynthesis (food) from leaves to other parts (1).

Excretion · Excretion in human beings

14 questions · 23 appearances · 7 in board papers · Kidneys, nephron, urine formation, selective reabsorption, dialysis · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 2 questions

Q147 **Multiple Choice** · 1 mark ★ 2 papers

Which organ acts like a natural dialysis chamber in the human body?

(a) Heart
(b) Brain
(c) Kidneys
(d) Pancreas

Source: CBSE–Sri Aurobindo Society competency items Ch 6 Q3 [F5 p405] | KV Sitapur PT-I 2024 fill in the blank (organ filtering waste and producing urine — kidney) [FM p9]

✓ Answer
(C) Kidneys.

Q148 **Multiple Choice** · 1 mark ★ 1 paper

Given below is a diagram of a nephron. Which row of the following table correctly shows where filtration and selective reabsorption occur?
(Rows — Filtration | Selective reabsorption) 1: P | Q 2: Q | S 3: Q | R 4: P | R

(a) Row 1
(b) Row 2
(c) Row 3
(d) Row 4

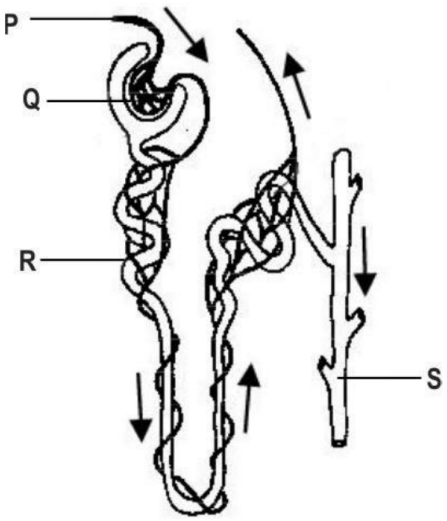


Figure from the question paper

Source: CBSE competency item bank — Life Processes Q4 [F4 p721]

✓ Answer
Row 3 — filtration in Q (glomerulus, the cluster of capillaries inside Bowman's capsule P) and selective reabsorption in R (tubular part of nephron).

⚠ **Note:** Some keys accept row 4 (P, R) taking P as Bowman's capsule where the filtrate collects; NCERT says the glomerulus filters the blood.

Assertion–Reason · 1 question

Q149 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Urethra in human male acts as urogenital canal.
Reason (R): Urethra carries only urine while sperms are carried by vasa deferentia only.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Source: KVS Delhi Pre-board-II 2024-25 Q19 [FM p89]

✔ **Answer**
(C) A is true, but R is false — urethra is a common passage for sperms and urine.

Very Short Answer · 4 questions

Q150 **Very Short Answer** · 2 marks ★★ 3 papers

(a) Define the term excretion. Why should animals excrete waste matter?
(b) Name the main excretory organ of human beings and state the form in which the excretory matter is thrown out of the body.

Source: KVS Lucknow Pre-board 2025-26 Q10 [FM p72] | KVS Lucknow Pre-board-I 2023-24 Q25 ('Mention the major organs that constitute the excretory system') [FM p43] | KV Sitapur PT-I 2023 Q7 (organ for elimination of nitrogenous waste) [FM p12]

✔ **Answer**
(a) The biological process of removal of harmful metabolic nitrogenous wastes from the body (1/2); these wastes are toxic and would harm the body if kept (1/2). (b) Kidneys (1/2); urine (1/2).

Q151 **Very Short Answer** · 2 marks ★ Board ×1 2 papers

Name the part of the human excretory system where nephrons are found. Write the structure and function of nephrons.

Source: CBSE 2023 · 31/1/1 Q24, 31/1/2 Q23, 31/1/3 Q23 [F1 p100, 164] | KVS Lucknow 1 Pre-board Q24 ('Describe the functions of nephrons') [FM p56]
Also asked as: Sample Question Paper-6 (2024-25) Q23 OR: 'State the function of Bowman's capsule and glomerulus.' [F8 p53]

✔ **Answer**
Kidneys (1/2). Structure: each nephron has a cup-shaped Bowman's capsule with a cluster of thin-walled capillaries (glomerulus) and a long tubular part (1/2 + 1/2). Function: filters blood to remove nitrogenous waste (urea, uric acid); useful substances like glucose, amino acids, salts and water are selectively reabsorbed (1/2).

Q152 **Very Short Answer** · 2 marks ★ 2 papers

Draw a diagram of human excretory system and label: ureter, kidney, urinary bladder and urethra.

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.13 Excretory system in human beings.

Source: KVS Lucknow Pre-board 2025-26 Q10 [FM p80] | KVS Lucknow First Pre-board 2024-25 Q22 (+ organs that store and release urine) [FM p31]

✔ **Answer**
Labelled diagram (NCERT Fig. 5.13) — 1/2 mark each label.

Q153 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Write one specific function each of the following organs in relation with excretion in human beings :
(i) Renal artery (ii) Urethra (iii) Glomerulus (iv) Tubular part of nephron

Source: CBSE 2023 · 31/4/1 Q23 [F1 p365]

✔ Answer
(i) Brings blood with nitrogenous wastes to the kidney. (ii) Passage for urine to pass out of the body. (iii) Filters the blood (filtration). (iv) Selective reabsorption of useful substances like glucose, amino acids, salts and water. (1/2 each)

Short Answer · 2 questions

Q154 **Short Answer** · 3 marks ★ Board ×2 2 papers

(i) What is meant by excretion?
(ii) Name the organ that connects the kidneys with the urinary bladder. State its function.
(iii) List two factors on which the amount of water reabsorbed depends.

Source: CBSE 2023 · 31/2/3 Q29(a) [F1 p248] | CBSE VI 31(B)/S CDBA/S Q29(b) (name kidney, bladder, ureter, urethra + two factors) (yr?) [F1]

✔ Answer
(i) Biological process of removal of harmful metabolic (nitrogenous) wastes from the body (1).
(ii) Ureter; carries urine from kidneys to the urinary bladder (1/2 + 1/2).
(iii) How much excess water there is in the body; how much dissolved waste has to be excreted (1/2 + 1/2).

Q155 **Short Answer** · 3 marks NEW

How does an artificial kidney (haemodialysis) work? How is it different from the working of a natural kidney?

Source: NEW — NCERT 5.5.1 Box

✔ Answer
Blood is passed through long tubes lined with a semi-permeable lining suspended in a tank of dialysing fluid of the same osmotic pressure as blood (except nitrogenous wastes) (1); wastes pass from blood into the fluid by diffusion and the purified blood is pumped back (1). Difference: in dialysis there is no reabsorption (1).

Long Answer · 2 questions

Q156 **Long Answer** · 5 marks ★★ 4 papers

(a) Name the organs that form the excretory system in human beings.
(b) Draw the structure of nephron. Describe in brief how urine is produced in the human body.

Source: KVS Lucknow Pre-board Q34 [FM p50] | KVS Lucknow Monthly Exam Oct 2024-25 Q16 (2+3) [FM p4] | KV Sitapur PT-I 2024 LA Q1 ('structure and function of human kidney') [FM p9] | KVS Delhi Pre-board-II 2024-25 Q35 (diagram with renal artery, urethra + functions of kidney, ureter, bladder) [FM p92]

✔ Answer
(a) A pair of kidneys, a pair of ureters, a urinary bladder and a urethra (1).
(b) Diagram of nephron (2). Urine formation: renal artery brings blood to the kidney → glomerulus filters it in Bowman's capsule → filtrate flows through the tubule where glucose, amino acids, salts and water are selectively reabsorbed → urine collects in collecting duct → ureter → urinary bladder (2).

Q157 **Long Answer** · 5 marks ★ Board ×1 1 paper

(a) Draw a well-labelled diagram of nephron and label at least 4 of its parts.
(b) Write the role of capillary cluster inside Bowman's capsule.
(c) What is meant by selective reabsorption?

▣ **Diagram to draw / re-drawn:** NCERT Fig. 5.14 Structure of a nephron.

Source: CBSE 2026 · 31/4/2 Q16(B), 31/4/3 Q16(B) [F4 p406, 438]

✔ Answer
(a) Diagram (NCERT Fig. 5.14) with: Bowman's capsule, glomerulus, tubule, collecting duct, renal artery branch, renal vein branch (any 4) (2 1/2).
(b) Glomerulus filters the blood — nitrogenous wastes, glucose, salts, water pass into Bowman's capsule (1).
(c) As the filtrate flows along the tube, useful substances like glucose, amino acids, salts and a major amount of water are taken back into the blood (1 1/2).

Case/Source-based · 3 questions

Q158 **Case/Source-based** · 4 marks ★ Board ×1 2 papers

Kidneys are vital organs for survival. Several factors like infections, injury or restricted blood flow to kidneys reduce the activity of kidneys. This leads to accumulation of poisonous wastes in the body, which can even lead to death. In case of kidney failure, an artificial kidney can be used. An artificial kidney is a device to remove waste products from the blood through dialysis.
(a) (i) Name the artery that brings oxygenated blood to the kidney. (ii) Name the cluster of thin-walled blood capillaries present in the Bowman's capsule. (1)
(b) In human excretory system name the organ which stores urine. Is this organ under hormonal control or nervous control? (1)
(c) (i) List two major steps involved in the formation of urine and state in brief their functions. (2)
OR
(c) (ii) In which part of the nephron does selective reabsorption take place? List the factors on which the amount of water reabsorbed depends. (2)

Source: CBSE 2024 · 31/4/1 Q38 (Series D4CBA/4) [F1 p403] | Sample paper Q15 [F6]

✔ Answer
(a)(i) Renal artery (ii) Glomerulus (1/2 + 1/2).
(b) Urinary bladder; nervous control (1/2 + 1/2).
(c)(i) Filtration — glomerulus filters blood into Bowman's capsule (1); selective reabsorption — useful substances like glucose, amino acids, salts, water reabsorbed in the tubule (1).
OR (ii) Tubular part of the nephron (1); how much excess water there is in the body and how much dissolved waste has to be excreted (1).

Q159 **Case/Source-based** · 4 marks ★ Board ×1 1 paper

Kidneys help to regulate the volume of fluid and various metabolic waste products in the body. Normally, kidneys filter about 180 L of fluid daily but the volume actually excreted is only a litre or two a day. Patients with kidney failures can be saved by dialysis and kidney transplant.
(a) Write the structure and function of Bowman's capsule.
(b) Although kidneys filter a large amount (about 180 L daily) of fluids, still the excretion from the body is only about a litre or two. Why?
(c) What is excretion? Why is it necessary for any living organism?
OR
(c) State two similarities between lungs and kidneys.

Source: CBSE 2026 · 31/5/1 Q15, 31/5/2 Q15, 31/5/3 Q15 [F4 p468, 502, 532]

✔ Answer
(a) Cup-shaped end of the nephron tubule enclosing the glomerulus; collects the filtrate from the blood (1).
(b) Most of the filtrate — useful substances and a major amount of water — is selectively reabsorbed in the tubules (1).
(c) Removal of harmful metabolic wastes; if not removed they are toxic and harm the body (2).
OR (c) Both have very large surface areas (alveoli / nephrons); both have thin-walled capillaries richly supplied with blood for exchange (2).

Q160 **Case/Source-based** · 4 marks ★ Board ×1 1 paper

The given diagram shows the human kidney and its associated structures (P and Q). Study the Table I and Table II that show the concentration of certain substances found within the structure P and Q.
Table I (Structure P): Urea 0.05, Amino acids 0.06, Salts 1.72, Glucose 0.10
Table II (Structure Q): Urea 1.00, Amino acids 0.00, Salts 1.60, Glucose 0.00
(A) Where are kidneys located in the human body? Name the filtration unit of them.
(B) List two factors on which reabsorption of water from the filtrate depends. Why is there variation in the concentration of given substance in structure P and Q listed in table I and II respectively?
OR
(C) If a person is suffering from diabetes, concentration of which substance present in structure Q (listed in table II) will be modified and why?

▣ **Figure from the question paper:** Figure needed: kidney with P and Q (F4 p99).

Source: CBSE 2026 · 31/8/1 Q15 [F4 p99–101]; 31/8/2 [F4 p131]; 31/8/3 [F4 p163]

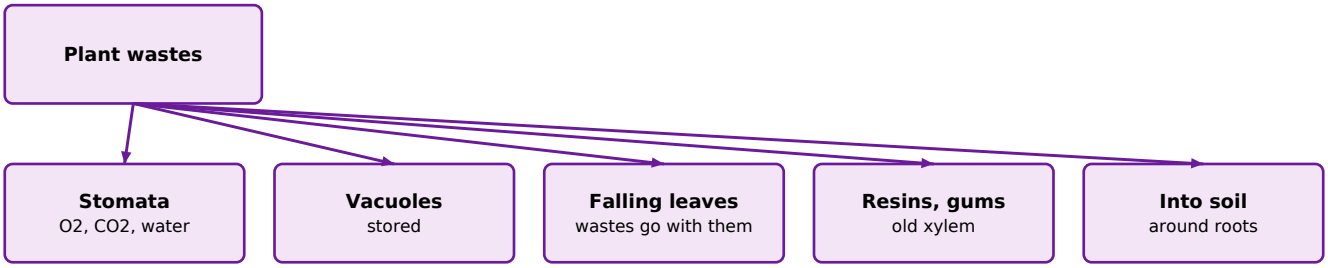
✔ Answer
(A) In the abdomen, on either side of the backbone; nephron (1).
(B) How much excess water there is in the body; how much dissolved waste has to be excreted (1). P carries blood (plasma) coming to the kidney, Q carries urine; in the nephron useful substances like glucose, amino acids and some salts are selectively reabsorbed and water is taken back, so urea becomes concentrated in Q (2).
OR (C) Glucose — in diabetes the blood sugar is very high, so all glucose cannot be reabsorbed and it appears in urine (Q) (2).

⚠ **Note:** P and Q read from the tables: P = blood reaching the kidney, Q = urine — confirm with the figure.

Excretion · Excretion in plants

3 questions · 3 appearances · 1 in board papers · How plants get rid of wastes · Prepared by Abhishek Das, TGT (Science)

Picture it (simple re-drawn diagram)



Multiple Choice · 1 question

Q161 **Multiple Choice** · 1 mark NEW

Which of the following is NOT a way in which plants get rid of wastes?

(a) Storing wastes in cellular vacuoles
(b) Storing wastes as resins and gums in old xylem
(c) Filtering blood in nephrons
(d) Getting rid of wastes stored in leaves that fall off

Source: NEW — NCERT 5.5.2

✔ Answer
(C) Filtering blood in nephrons — plants have no nephrons. They store wastes in vacuoles, leaves that fall off, resins and gums in old xylem, and some are excreted into the soil.

Very Short Answer · 1 question

Q162 **Very Short Answer** · 2 marks ★★ Board ×2 3 papers

Explain in brief two ways by which leaves of a plant help in excretion.

Source: CBSE 2023 · 31/5/1 [F1 p466], 31/5/2 Q25(b) [F1 p495], 31/5/3 [F1 p524] | CBSE 2026 · 31/4/2 Q14(a) ('Plants do not have an excretory system, so how do they excrete their wastes?') [F4 p406] | CBSE SQP 2025-26 Q10 (key) [F8 p305]
Also asked as: CBSE SQP 2025-26 Q10: 'Unlike animals, plants do not have any excretory products as they do not eat food. Comment upon the statement with justification.' [F8 p305; copy F5 p283]

✔ Answer
Oxygen (a waste of photosynthesis) and excess water are removed through stomata by diffusion and transpiration (1). Wastes are stored in leaves that fall off (1).

Short Answer · 1 question

Q163 **Short Answer** · 3 marks NEW

'Plants use completely different strategies for excretion than those of animals.' Justify the statement with three examples.

Source: NEW — NCERT 5.5.2

✔ Answer
(i) Oxygen from photosynthesis and CO_2 at night diffuse out through stomata (1). (ii) Excess water is removed by transpiration (1). (iii) Wastes are stored in cellular vacuoles, in leaves that fall off, or as resins and gums in old xylem; some are excreted into the soil (1).

Summary — questions by sub-theme and type

Sub-theme	MCQ	A-R	VSA	SA	LA	Case	Total	Appear.	Board
Life processes and modes of nutrition	5	1	1	1	0	1	9	11	4
Photosynthesis and stomata	14	1	2	2	2	2	23	28	11
Nutrition in human beings	15	5	8	5	2	2	37	45	21
Breakdown of glucose (aerobic and anaerobic)	7	1	2	5	1	1	17	24	10
Human respiratory system and exchange of gases	6	3	4	4	2	0	19	23	9
Human heart and double circulation	7	6	5	2	0	0	20	32	13
Blood vessels, blood and lymph	4	1	3	2	0	1	11	11	4
Transportation in plants	3	1	4	2	0	0	10	16	8
Excretion in human beings	2	1	4	2	2	3	14	23	7
Excretion in plants	1	0	1	1	0	0	3	3	1
Total	64	20	34	26	9	10	163	216	88

Top 10 — revise these the night before the exam

#	Q no.	Question	Board	Pap.
1	Q119	Briefly mention the steps in double circulation through human heart.	3	8
2	Q10	Opening and closing of stomata is due to :	3	4
3	Q53	Write two roles each of (i) bile juice and bile salts and (ii) pancreatic enzymes in the process of digestion.	3	4
4	Q120	(a) Why is it important to prevent oxygenated and deoxygenated blood from mixing in birds and mammals? (b) Which animals can tolerate some...	2	3
5	Q162	Explain in brief two ways by which leaves of a plant help in excretion.	2	3
6	Q80	During respiration, glucose is broken down into pyruvate. State the end products formed from it on further breakdown, in each of the...	2	2
7	Q96	Give reasons : (a) During a breathing cycle, the lungs always contain a residual volume of air. (b) As compared to oxygen, carbon dioxide...	2	2
8	Q100	(i) List any two characteristics of lungs which make them an efficient respiratory system. (ii) Name the part of human respiratory system :...	2	2
9	Q106	Select the correct statements from the following about the human heart : (i) Right atrium receives oxygenated blood from lungs through...	2	2
10	Q107	The valves in the human heart ensure that (i) Oxygen-rich blood flows from left atrium to left ventricle only. (ii) Deoxygenated blood...	2	2

Science with Abhishek Sir

Prepared by Abhishek Das, TGT (Science)

PYQ HUNT · Chapter 6 · Control and Coordination

CBSE Class 10 Science (086) · Chapterwise question bank with answers · 2026-27 syllabus (old book: Ch 7)

13	72	271	182
files gone through (about 3,700 pages)	papers with this chapter (23 board)	question appearances found	unique questions after clubbing

What I went through

Kind of paper	Papers with Ch 6 questions	Question appearances
CBSE board papers (2023–2026, supplementary, old pattern)	17	72
CBSE board papers for visually impaired candidates	6	19
CBSE sample papers	2	5
CBSE question banks (CFPQ, competency items)	4	43
KVS / Sahodaya pre-boards and tests	19	67
Practice / guide sample papers	24	65
Total	**72**	**271**

In this chapter

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Theme map	p. 56	Must-do top 20	p. 57
Receptors, neuron and nerve impulse	p. 58	Reflex action and reflex arc	p. 65
Human brain – parts and functions	p. 72	Protecting the brain and spinal cord; CNS and PNS	p. 80
Immediate response to stimulus (touch-me-not)	p. 83	Movement due to growth – tropisms and tendrils	p. 86
Plant hormones	p. 97	Endocrine glands and their hormones	p. 104
Timing and amount of hormones – feedback...	p. 118	Nervous and hormonal coordination compared	p. 120
Summary	p. 123		

How to read a question box: see page iv at the front of the book.

Concept map – what is asked from where

Animals – Nervous System (NCERT 6.1)

Receptors, neuron and nerve impulse

21 questions · 27 papers · 7 board papers

Most asked: Q1 – In a nerve cell (neuron), the conversion of electrical signal to chemical ...

Reflex action and reflex arc

19 questions · 21 papers · 8 board papers

Most asked: Q22 – Sensory nerve of a reflex arc carries information from the receptor cells to ...

Human brain – parts and functions

24 questions · 26 papers · 11 board papers

Most asked: Q52 – (A) Name the part of brain which is responsible for the following actions : (i) ...

Protecting the brain and spinal cord; CNS, PNS; limits of electrical impulses

8 questions · 16 papers · 8 board papers

Most asked: Q68 – (a) Electrical impulses are an excellent means to respond to stimuli in animal ...

Coordination in Plants (NCERT 6.2)

Immediate response to stimulus (touch-me-not)

6 questions · 8 papers · 3 board papers

Most asked: Q73 – Observe the given figures A and B. When chhui-mui (sensitive) plant is touched, ...

Movement due to growth – tropisms and tendrils

22 questions · 25 papers · 8 board papers

Most asked: Q79 – Identify the type of tropic movement that is responsible for the movement of ...

Plant hormones

20 questions · 27 papers · 10 board papers

Most asked: Q112 – (a) Where are auxins synthesised? How are they related to phototropism? OR (b) ...

Hormones in Animals (NCERT 6.3)

Endocrine glands and their hormones

47 questions · 43 papers · 15 board papers

Most asked: Q154 – Name the hormone released and the gland which secretes it in human beings ...

Timing and amount of hormones – feedback mechanism

7 questions · 9 papers · 4 board papers

Most asked: Q174 – (i) Name the disorder which a person is likely to suffer from due to the ...

Nervous and hormonal coordination compared

8 questions · 9 papers · 2 board papers

Most asked: Q180 – (i) List three points of difference between nervous and hormonal mechanisms for ...

Theme map (NCERT order)

Theme	Sub-theme	Q numbers	MCQ	A-R	VSA	SA	LA	Case
Animals – Nervous System	Receptors, neuron and nerve impulse	Q1–Q21	12	3	4	1		1
Animals – Nervous System	Reflex action and reflex arc	Q22–Q40	3	2	6	4	1	3
Animals – Nervous System	Human brain – parts and functions	Q41–Q64	11		7	1	2	3
Animals – Nervous System	Protecting the brain and spinal cord; CNS, PNS; limits of electrical impulses	Q65–Q72	3		3	1		1
Coordination in Plants	Immediate response to stimulus (touch-me-not)	Q73–Q78	1		2	1		2
Coordination in Plants	Movement due to growth – tropisms and tendrils	Q79–Q100	11			3	1	7
Coordination in Plants	Plant hormones	Q101–Q120	10	1	6	1	1	1
Hormones in Animals	Endocrine glands and their hormones	Q121–Q167	21	4	8	7	3	4
Hormones in Animals	Timing and amount of hormones – feedback mechanism	Q168–Q174			2	4	1	
Hormones in Animals	Nervous and hormonal coordination compared	Q175–Q182		3	2		3	

Science with Abhishek Sir

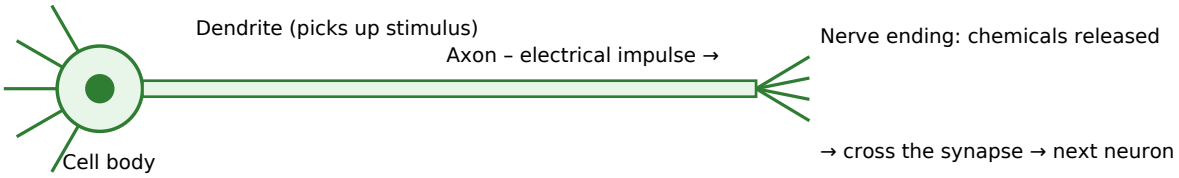
Must-do top 20 (most asked – board papers first)

#	Q	Question	Type	Board	Papers
1	Q112	(a) Where are auxins synthesised? How are they related to phototropism? OR (b) There is a hormone which ...	VSA	6	7
2	Q154	Name the hormone released and the gland which secretes it in human beings during scary situations. How does ...	SA	5	5
3	Q68	(a) Electrical impulses are an excellent means to respond to stimuli in animal bodies. List any two ...	VSA	4	4
4	Q101	A plant growth inhibitor hormone which causes wilting of leaves is called :	MCQ	3	4
5	Q71	(a) List two constituents of Central Nervous System (CNS). How are these components protected? (b) Write two ...	SA	2	5
6	Q52	(A) Name the part of brain which is responsible for the following actions : (i) Maintaining posture and ...	VSA	2	2
7	Q79	Identify the type of tropic movement that is responsible for the movement of the pollen tube towards an ovule ...	MCQ	1	5
8	Q1	In a nerve cell (neuron), the conversion of electrical signal to chemical signal occurs in/at :	MCQ	1	4
9	Q41	A man underwent MRI of brain which shows some defects in the cerebellum of his brain. Which activity of that ...	MCQ	1	4
10	Q102	Select from the following a plant hormone which promotes cell division.	MCQ	1	3
11	Q113	What are plant hormones? Name one plant hormone each responsible for (i) phototropism and (ii) promotion of ...	VSA	1	3
12	Q180	(i) List three points of difference between nervous and hormonal mechanisms for control and coordination in ...	LA	1	3
13	Q2	Electrical impulse travels in a neuron from	MCQ	1	2
14	Q22	Sensory nerve of a reflex arc carries information from the receptor cells to the :	MCQ	1	2
15	Q33	(a) Name the gland and the hormone secreted by it in scary situations in human beings. List any two responses ...	SA	1	2
16	Q37	(a) (i) Define a reflex arc. Why have reflex arcs evolved in animals? Trace the sequence of events which ...	LA	1	2
17	Q42	The part of human brain which controls muscular coordination is :	MCQ	1	2
18	Q43	Following are the statements about the different parts of the brain. Select the correct statements. (i) The ...	MCQ	1	2
19	Q53	A person is making a list to purchase few things from a nearby market. Explain how the fore-brain plays an ...	VSA	1	2
20	Q69	How is the spinal cord protected in the human body?	VSA	1	2

Animals – Nervous System · Receptors, neuron and nerve impulse

21 questions · 27 papers · 7 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)



Multiple Choice

Q1 Multiple Choice · 1 mark · ★★ Board ×1 — 4 papers

In a nerve cell (neuron), the conversion of electrical signal to chemical signal occurs in/at :

(A) dendritic end
(B) cell body
(C) axon
(D) axonal end

Source
- CBSE VI · 11-31(B) Set-5 (yr?) — Q13 [F9 p129]
- KVS Lucknow Monthly Test (30 marks) (yr?) — Q3 [FM p61–62]
- Bangalore Sahodaya Pre-board 1 2025-26 (Set 3) — Q2 [F5 p545]
- Practice paper F6-5 — Q4 [F6 p354, key p362]

Also asked as: Bangalore 2025-26 Q2 gives options Synapses / Dendrites / Axon / Cell body → answer (A) Synapse (the chemicals are released at the synapse). Practice paper F6-5 gives Neuromuscular junction / Dendrites / Axon / Cell body; its key (a) is the only option at an axon ending.

✔ Answer
(D) axonal end. At the end of the axon, the electrical impulse sets off the release of some chemicals.

⚠ **Note** Different option sets in different papers – teach the idea: "electrical → chemical at the end of the axon (synapse)".

Q2 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

Electrical impulse travels in a neuron from

(A) Nerve ending → Axon → Cell body → Dendrite
(B) Dendrite → Cell body → Axon → Nerve ending
(C) Cell body → Dendrite → Axon → Nerve ending
(D) Dendrite → Axon → Nerve ending → Cell body

Source
- CBSE 2025 · 31/6/3 · GF6HE — Q8 [F4 p7]
- Practice paper F6-8 — Q7 [F6 p400, key p407]

✔ Answer
(B) Dendrite → Cell body → Axon → Nerve ending. The impulse is set off at the dendritic tip, travels to the cell body and then along the axon to its end.

Q3 Multiple Choice · 1 mark · ★ Board ×1 — 1 paper

Which of the following statements is/are true about a neuron?
I. Dendrites of neuron pass the impulse to the axon.
II. Axon of neuron carries the impulse from the cell body.
III. Sensory neuron carries the impulse to the specific effectors.
IV. Transmission of impulse from a neuron to a muscle fibre occurs through neuro-muscular junction.

(A) I only
(B) III only
(C) II and III
(D) II and IV

Source
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — Q10 [F4 p247]

✔ Answer
(D) II and IV. Dendrites pass the impulse to the cell body (not straight to the axon); motor neurons, not sensory neurons, carry impulses to effectors.

Q4 Multiple Choice · 1 mark · ★ 1 paper

After our nose senses a smell, which option shows the mechanism of the travelling of sense signals in our body?

(A) olfactory receptors → dendritic tip of a nerve cell → axon → nerve ending → release of signal → dendritic tip of other nerve cell
(B) olfactory receptors → dendritic tip of a nerve cell → axon → cell body → release of signal → dendritic tip of other nerve cell
(C) gustatory receptors → dendritic tip of a nerve cell → cell body → axon → release of signal → dendritic tip of other nerve cell
(D) gustatory receptors → dendritic tip of a nerve cell → axon → cell body → release of signal → dendritic tip of other nerve cell

Source
• KVS Lucknow Pre-board II 2023-24 — Q11 [FM p36]

✔ Answer
None of the four options is fully correct as printed. Smell is detected by olfactory receptors and the impulse goes dendrite → cell body → axon → nerve ending. Option (A) is the best choice (right receptor, and the signal leaves from the nerve ending); it only leaves out "cell body".

⚠ **Note** Flawed item: the fully correct order (olfactory receptor → dendrite → cell body → axon → nerve ending) is not given. Marked (A) as best option.

Q5 Multiple Choice · 1 mark · ★ 1 paper

What is the functional unit of the nervous system?

(A) Neuron
(B) Axon
(C) Synapse
(D) Dendrite

Source
• PM SHRI KV Sitapur Periodic Test-2 2024-25 — Q5 [FM p1]

✔ Answer
(A) Neuron.

Q6 Multiple Choice · 1 mark · ★ 1 paper

The gap between two neurons is called a

(A) dendrite
(B) synapse
(C) axon
(D) impulse

Source
• KVS Lucknow Pre-board 1 2022-23 — Q12 [FM p16]

✔ Answer
(B) synapse.

Q7 Multiple Choice · 1 mark · ★ 1 paper

Which neuron carries impulses from receptor to brain?

(A) Motor neuron
(B) Sensory neuron
(C) Both sensory neuron and motor neuron
(D) Neither sensory neuron nor motor neuron

Source
• Practice paper F6-1 (two copies) — Q7 [F6 p258, key p266]

✓ Answer
(B) Sensory neuron.

Q8 Multiple Choice · 1 mark · ★ 1 paper

They carry message from receptor organs to the brain and spinal cord.

(A) Sensory neurons
(B) motor neurons
(C) both a and b
(D) None of these

Source
• KV Sitapur PT-II (yr?) — Q1 [FM p10]

✓ Answer
(A) Sensory neurons.

Q9 Multiple Choice · 1 mark · ★ 1 paper

Look at the figure below and identify the structure labelled incorrectly.

(A) A – Neuromuscular Junction
(B) B – Axon
(C) C – Muscle fibre
(D) D – Dendrite

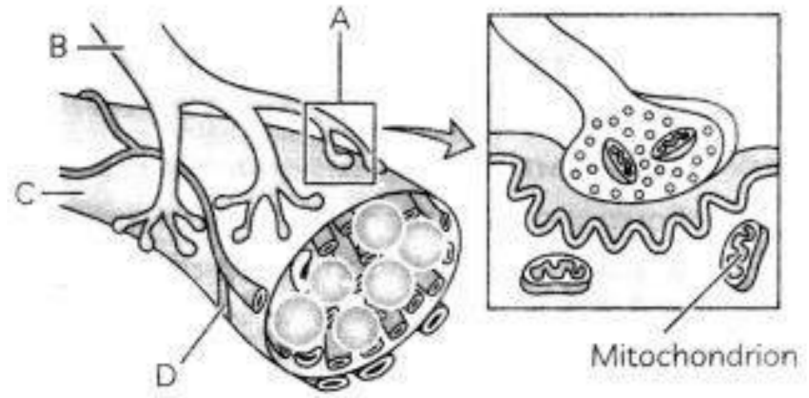


Figure from the question paper – Bangalore Sahodaya PB 2024-25 Set 1 Q11

Source
• Bangalore Sahodaya Pre-board 1 2024-25 (Sets 1, 2) — Set 1 Q11 [F5 p4, key p25]

✓ Answer
(D) D – Dendrite (school key). In the figure D points to the muscle fibre, not a dendrite.

⚠ **Note** Figure checked: C also points to a nerve branch, not the muscle fibre, so the item is weak. Keep the key (D).

Q10 Multiple Choice · 1 mark · ★ 1 paper

What is the correct direction of flow of electrical impulses?

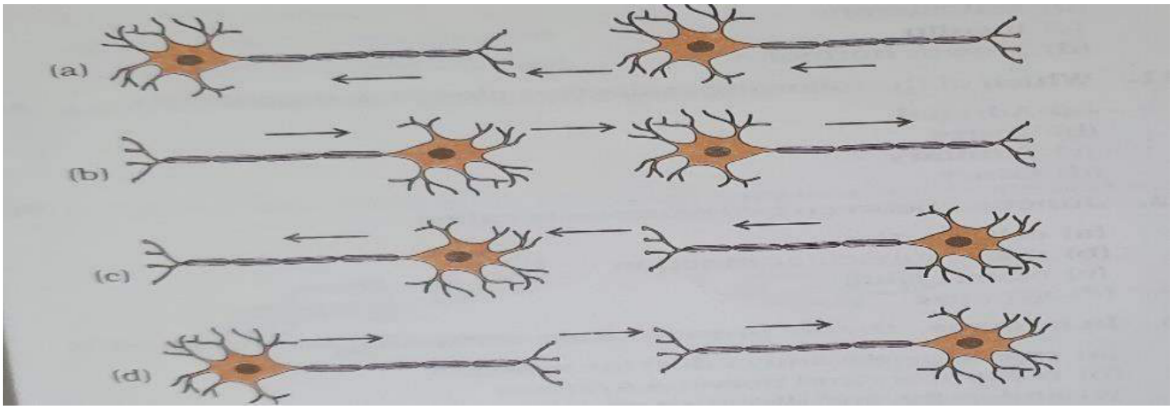


Figure from the question paper – Bangalore Sahodaya PB 2024-25 Set 2 Q11 (options a–d)

Source
• Bangalore Sahodaya Pre-board 1 2024-25 (Sets 1, 2) — Set 2 Q11 [F5 p14]

✔ Answer
(c) In (c) the impulse goes dendrite → cell body → axon → nerve ending in the first neuron, then crosses to the dendrites of the next neuron and again travels cell body → axon.

⚠ **Note** Answer worked out from the figure; no school key seen.

Q11 Multiple Choice · 1 mark · ★ 1 paper

Match the following with correct response.
Column A: (i) Junction between neuron (ii) The largest cell in the human body (iii) Sense organs for smell (iv) Sense organs for touch
Column B: (a) Thermoreceptors (b) Neuron (c) Synapse (d) Olfactory receptors

(A) (i)-(c), (ii)-(b), (iii)-(d), (iv)-(a)
(B) (i)-(b), (ii)-(c), (iii)-(a), (iv)-(d)
(C) (i)-(d), (ii)-(a), (iii)-(b), (iv)-(c)
(D) (i)-(a), (ii)-(d), (iii)-(c), (iv)-(b)

Source
• Practice paper F6-9 — Q3 [F6 p414, key p422]

✔ Answer
(i)-(c), (ii)-(b), (iii)-(d), (iv)-(a).

⚠ **Note** Option letters were not readable in the text layer; options re-built from the key. "Thermoreceptors" is beyond NCERT wording.

Q12 Multiple Choice · 1 mark · ★ 1 paper

(Figure of a neuron.) Which of the following is NOT true about the cell shown?

(A) It is the longest cell in human body.
(B) It transmits messages in the form of nerve impulses.
(C) It uses both amino acids and fatty acids as a respiratory substrate.
(D) It is not repaired, when injured.

▣ **Figure in the question paper:** Figure of a neuron. *(screenshot requested – see teacher's list)*

Source
• Practice paper F8-d — Q12 [F8 p52, key p58]

✔ Answer
(c) It uses both amino acids and fatty acids as a respiratory substrate.

⚠ **Note** Options (a), (c), (d) go beyond NCERT; keep for practice only.

Assertion–Reason

Q13 Assertion–Reason · 1 mark · ★ Board ×1 — 1 paper

Assertion (A): Receptors are usually located in our sense organs and perceive a particular stimulus.
Reason (R): Different sense organs have different receptors for detecting stimuli.

Source
• CBSE 2024 · 31/3 (sets 1–3) · DAA1B — 31/3/2 Q20 [F1 p305]

✔ Answer
(A) Both A and R are true and R is the correct explanation of A.

⚠ **Note** No official key in the files. R explains why each sense organ picks up a particular stimulus, so (A) is taken. Check with the 2024 marking scheme if available.

Q14 Assertion–Reason · 1 mark · ★ Board ×1 — 1 paper

Assertion (A): Motor neurons carry signals from the spinal cord to the effector organ.
Reason (R): Sensory neurons carry signals from receptors towards the spinal cord.

Source
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/3 Q9 [F4 p161]

✔ Answer
(B) Both A and R are true, but R is not the correct explanation of A.

Q15 Assertion–Reason · 1 mark · ★ — 1 paper

Assertion: The nervous system is responsible for rapid responses to stimuli.
Reason: The nervous system uses electrical signals to transmit information quickly.

Source
• PM SHRI KV Sitapur Periodic Test-2 2024-25 — Q12 [FM p2]

✔ Answer
(A) Both A and R are true and R is the correct explanation of A.

Very Short Answer

Q16 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

Write the name and function of parts (i) and (ii) in the diagram of a neuron given below.

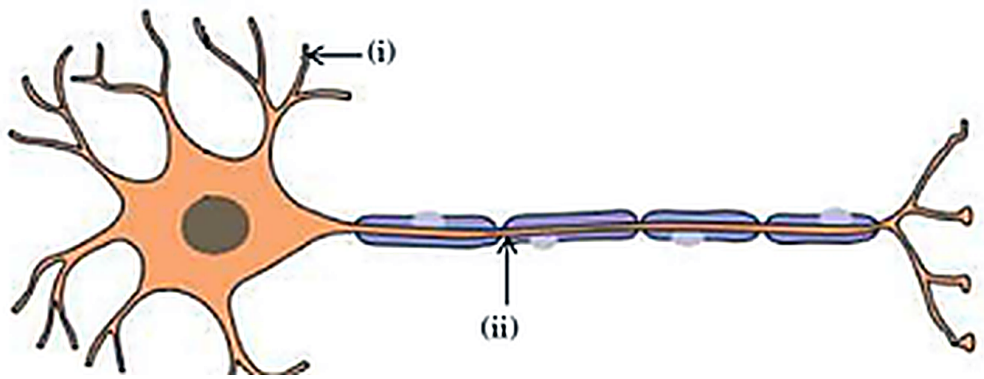


Figure from the question paper (teacher's screenshot, enhanced) – CBSE 2023, 31/5/1 Q22

Source
• CBSE 2023 · 31/5 (sets 1–3) · Z1XYW — Q22 [F1 p466]

✔ Answer
(i) Dendrite – information from the environment is picked up at the end of the dendritic tip and sets off an electrical impulse [1]. (ii) Axon – carries the electrical impulse from the cell body to its end (nerve ending) [1].

Q17 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(a) How is an electric impulse created in human nervous system? Identify the parts of a neuron which helps the nerve impulse to travel (i) towards the cell body (ii) away from the cell body.
OR
(b) With the help of an example, explain how does the feedback mechanism regulate the hormone secretion.

Source
• CBSE 2023 · 31/6 (sets 1–3) — 31/6/3 Q22 [F9-OCR p49]

✔ Answer
(a) Information from the environment is detected by receptors; the information acquired at the end of the dendritic tip of a nerve cell sets off a chemical reaction that creates an electrical impulse [1]. (i) Dendrite [½] (ii) Axon [½].
OR
(b) Example – insulin: if the sugar level in blood rises, it is detected by the cells of the pancreas, which respond by producing more insulin [1]; as the blood sugar level falls, insulin secretion is reduced [1].

Q18 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(a) List two differences between the movement of leaves of a sensitive plant and the movement of a shoot towards light.
OR
(b) What happens at synapse between two neurons? State briefly.

Source
• CBSE 2023 · 31/6 (sets 1–3) — 31/6/1 Q22; 31/6/2 Q26 [F1 p551; F9-OCR p19]

Also asked as: Also asked as Practice paper F6-1 Q12 (movement of sensitive plant vs shoot towards light).

✔ Answer
(a) Sensitive plant: no growth is involved; movement is not in the direction of the stimulus / happens quickly. Shoot towards light: growth is involved (auxin makes cells on the shaded side grow longer); movement is directional and slow. [1 + 1]
OR
(b) At the end of the axon the electrical impulse sets off the release of some chemicals [1]. These chemicals cross the gap (synapse) and start a similar electrical impulse in a dendrite of the next neuron [1].

Q19 Very Short Answer · 2 marks · ★ — 1 paper

Draw a diagram of neuron and name and label the part
(a) where information is acquired,
(b) through which information travels as an electric impulse, and
(c) where the electric impulse must be converted into a chemical signal for onward transmission.

Source
• Practice paper F6-4 (two copies) — Q12 [F6 p323, p339; key p331]

Also asked as: NCERT in-text question: "What is the function of receptors in our body?" style.

✔ Answer
Diagram of neuron (NCERT Fig. 6.1 a) [1]. (a) Dendrite / end of the dendritic tip [½]. (b) Axon [½]. (c) Nerve ending (end of the axon) [½]... (marks as per paper).

Short Answer

Q20 Short Answer · 3 marks · ★★★ 7 papers

Draw and explain how the nerve cells help in transmission of impulses?

Source
- CBSE Sample Paper 2025-26 — Q13 [F5 p284; F6 p228; F8 p306, key p320]
- Practice paper F6-3 — Q16 OR [F6 p307]
- Practice paper F6-1 (two copies) — Q16 OR (b) [F6 p259, key p268]
- KVS Lucknow Pre-board 2025-26 (paper A) — Q14 [FM p72]
- Practice paper F6-7 — Q16 OR [F6 p385]
- KVS Delhi Pre-board II 2024-25 — Q24 [FM p89]
- PM SHRI KV Sitapur Periodic Test-2 2024-25 — Q20 [FM p2]

Also asked as: "With the help of labelled diagram explain the general scheme ... how nervous impulses travel in the body" (Practice F6-3 Q16 OR); "How do nerve impulses travel in the body?" (Practice F6-1 Q16 OR b); "Draw a labelled diagram of a neuron and explain how receptors help in transmission of information" (KVS Lucknow PB 2025-26 A, Q14); "Draw the structure of a neuron and describe its function" (Practice F6-7 Q16 OR); "Draw a neat diagram of a neuron and label (i) dendrite (ii) axon" (KVS Delhi PB-II 2024-25 Q24); "Describe ... structure of neuron" (KV Sitapur PT-2 2024-25 Q20).

✔ Answer

Diagram of neuron (dendrite, cell body, nucleus, axon, nerve ending) [1].
- Information from the environment is detected by the specialised tips of some nerve cells (receptors). It is acquired at the end of the dendritic tip and sets off a chemical reaction that creates an electrical impulse [½].
- The impulse travels from the dendrite to the cell body, and then along the axon to its end [½].
- At the end of the axon, the electrical impulse sets off the release of some chemicals [½].
- These chemicals cross the gap, or synapse, and start a similar electrical impulse in a dendrite of the next neuron. This is how nervous impulses travel in the body [½].

Case / Source-based

Q21 Case / Source-based · 4 marks · ★ 2 papers

Read the text carefully and answer the questions:
In animals, control and coordination are provided by nervous and muscular tissues. Touching a hot object is an urgent and dangerous situation for us. We need to detect it and respond to it. How do we detect that we are touching a hot object? All information from our environment is detected by the specialised tips of some nerve cells. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory receptors will detect the smell. This information, acquired at the end of the dendritic tip of a nerve cell, sets off a chemical reaction that creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end.
(a) Name the largest cell present in the body.
(b) What is an axon?
(c) Name one gustatory receptor and one olfactory receptor present in human beings.
OR
Name the following parts of a neuron: a. Where information is acquired. b. Through which information travels as an electrical impulse.

Source
- Practice paper F8-c — Q38 [F8 p40, key p48]
- Practice paper F8-e — Q38 [F8 p72, key p80]

✔ Answer

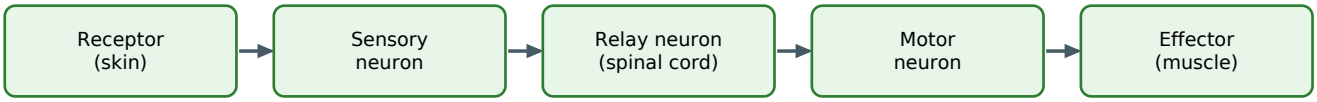
(a) Nerve cell (neuron) [1]. (b) Axon is the long part of the nerve cell that carries the electrical impulse from the cell body to its end [1]. (c) Gustatory receptors – taste buds on the tongue; olfactory receptors – in the nose [1 + 1].
OR a. Dendrite (dendritic tip) b. Axon.

⚠ **Note** Key calls the nerve cell "the largest cell"; NCERT does not say this – many books call it the longest cell. Accept "nerve cell".

Animals – Nervous System · Reflex action and reflex arc

19 questions · 21 papers · 8 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)



Multiple Choice

Q22 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

Sensory nerve of a reflex arc carries information from the receptor cells to the :

(A) spinal cord
(B) brain
(C) muscles of the effector organ
(D) bones of the receptor organ

Source
- CBSE 2023 · 31/4 (sets 1–3) · Z1XYW/4 — 31/4/3 Q11 [F1 p436]
- Practice paper F6-9 — Q4 [F6 p414, key p422]

✓ Answer
(a) spinal cord.

Q23 Multiple Choice · 1 mark · ★★ — 3 papers

Which is the correct sequence of the components of a reflex arc?

(A) Receptors → Muscles → Sensory neuron → Motor neuron → Spinal cord
(B) Receptors → Motor neuron → Spinal cord → Sensory neuron → Muscle
(C) Receptors → Spinal cord → Sensory neuron → Motor neuron → Muscle
(D) Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

Source
- KVS Ahmedabad Pre-board 2025-26 (Sets A, B) — Set A Q3; Set B Q3 [F9 p505, p517]
- Bangalore Sahodaya Pre-board 1 2025-26 (Set 3) — Q5 [F5 p546]
- CBSE Competency Item Bank 2021 (SAS) — Item 4 (SAS21S100704) [F5 p409, key p463]

Also asked as: CBSE item bank version: "Receptor → Sensory Neurone → Relay Neurone → Motor Neurone → Effector" – answer B.

✓ Answer
(D) Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle.

Q24 Multiple Choice · 1 mark · ★ — 1 paper

The figure shows a reflex arc formed in response to heat. What is labelled as 'X' in the figure?

(A) Cerebrum
(B) Spinal cord
(C) Pituitary gland
(D) Hypothalamus

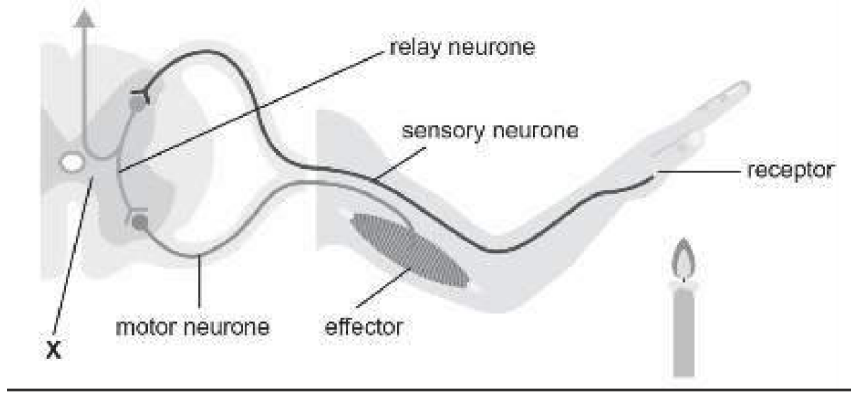


Figure from the question paper – CBSE Competency Item Bank 2021, item 5

Source
• CBSE Competency Item Bank 2021 (SAS) — Item 5 (SAS21S100705) [F5 p409, key p464]

✔ Answer
(B) Spinal cord.

Assertion–Reason

Q25 Assertion–Reason · 1 mark · ★ Board ×1 — 1 paper

Assertion (A): A reflex arc provides an immediate and automatic response to a stimulus.
Reason (R): The nerve pathway in a reflex arc involves the brain for the fastest possible processing.

Source
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/2 Q9 [F4 p129]

✔ Answer
(C) Assertion (A) is true, but Reason (R) is false. Reflex arcs are formed in the spinal cord; the thinking part of the brain is not involved first.

Q26 Assertion–Reason · 1 mark · ★ — 1 paper

Assertion (A): All reflex actions are involuntary actions but only some involuntary actions are reflex actions.
Reason (R): Reflex actions take the shortest route from the receptor (detector of stimulus) to the effector (producer of response).

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.13 [F6 p14]

✔ Answer
B. Both (A) and (R) are true but (R) is not the correct explanation of the assertion.

Very Short Answer

Q27 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(A) Varun is diabetic. His latest ultrasound reports showed a blockage in his pancreatic duct. How will this affect the dual functioning of the pancreas?
OR
(B) Sunil unconsciously touched the hot iron rod and immediately withdrew his hand. Which type of action is involved? Also define this action. Draw a flow chart to show the path followed for this action.

Source
• CBSE 2026 · 31/4 (sets 1–3) — 31/4/1 Q12; 31/4/2 Q10; 31/4/3 Q12 [F4 p372, p404, p436]

✔ Answer

(A) Pancreas works as a digestive gland (pancreatic juice with trypsin and lipase reaches the small intestine through the duct) and as an endocrine gland (insulin goes directly into blood) [½]. Blockage of the duct stops pancreatic juice reaching the intestine, so digestion of proteins and fats is affected [1]; insulin is not affected by the duct because hormones are poured directly into blood – his diabetes is due to less insulin [½].

OR

(B) Reflex action [½]. A reflex action is a sudden action in response to something in the environment, done without thinking [½]. Flow chart: Receptor (skin) → Sensory neuron → Relay neuron in spinal cord → Motor neuron → Effector (muscle in arm) → hand withdrawn [1].

Q28 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(A) Observe the given figure and identify the labelled parts P, Q, R and S.

OR

(B) Which of the plant hormones are responsible for the following processes? (i) Promote cell division (ii) Inhibition of growth (iii) Detection of light (iv) Wilting of leaves

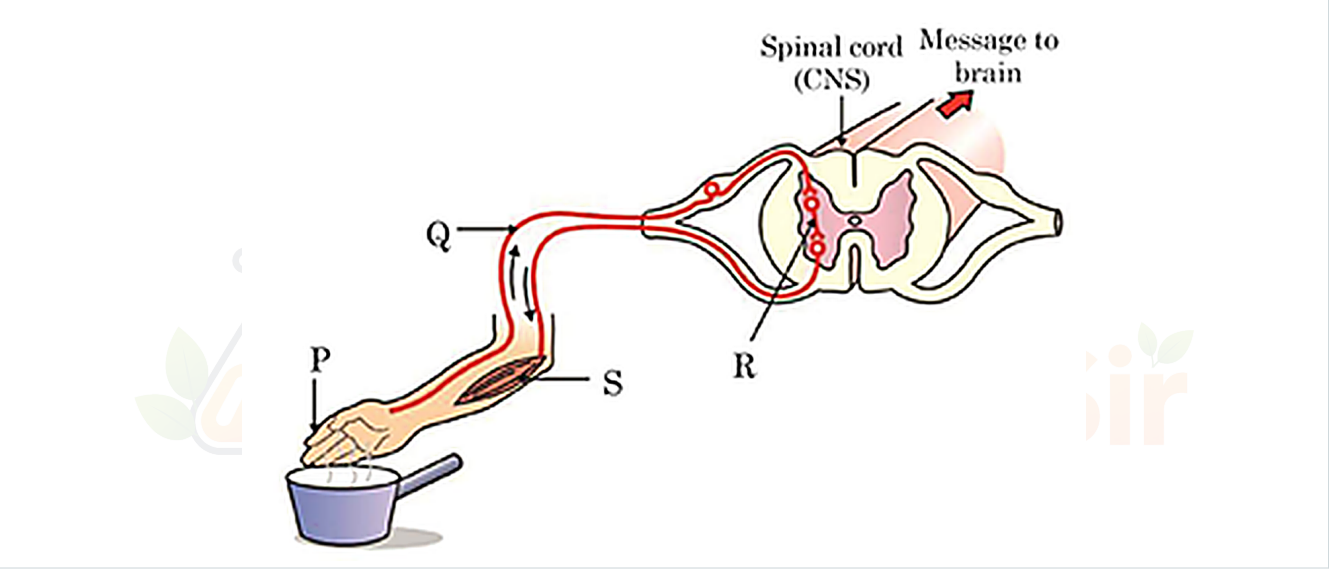


Figure from the question paper (teacher's screenshot, enhanced) – CBSE 2026, 31/5/1 Q11

Source
- CBSE 2026 · 31/5 (sets 1–3) — 31/5/1 Q11; 31/5/2 Q10; 31/5/3 Q12 [F4 p466, p498, p530]

✔ Answer

(A) P – receptor (in the skin of the hand), Q – sensory neuron, R – relay neuron in the spinal cord, S – effector (muscle of the arm) [½ × 4].

OR

(B) (i) Cytokinin (ii) Abscisic acid (iii) Auxin (it is synthesised at the shoot tip and helps the plant bend towards light) (iv) Abscisic acid [½ × 4].

Q29 Very Short Answer · 2 marks · ★★ — 3 papers

Define reflexes and draw the neat flow-chart of a reflex arc when we touch a hot plate.

Source
- KVS Lucknow Pre-board I 2023-24 — Q21 [F5 p255; FM p43]
- PM SHRI KV Sitapur Periodic Test-2 2025-26 — Q17 [FM p69]
- KVS Lucknow Monthly Test (30 marks) (yr?) — Q12 [FM p64]

Also asked as: "Define reflex action. With the help of a flowchart show the path of a reflex action such as sneezing" (KV Sitapur PT-2 2025-26 Q17); "What is Reflex Action? Give any two examples. Draw a Reflex Arc. What is the role of brain in reflex action" (KVS Lucknow Monthly Test Q12).

✔ Answer
Reflex: a sudden action in response to something in the environment, done without thinking [½]. Flow chart: Receptor (in skin) → Sensory neuron → Relay neuron (spinal cord) → Motor neuron → Effector (muscles of arm) → hand pulled back [1½].

Q30 **Very Short Answer** · 2 marks · ★ 1 paper

When some particles (like sand or dust) fall into our eyes, our eyes start to water on their own and we blink to get the particle out of our eyes. This is a type of reaction to a stimulus that the human body shows.
(a) Is the above-mentioned reaction involuntary or voluntary?
(b) What is the specific name given to the pathway that brings about this immediate reaction to a stimulus?
(c) What are the names given to: (i) the organ that responds to a stimulus (ii) the part of the brain that receives sensory impulses

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q13 (Life Processes set) [F4 p724, key p730–731]

✔ Answer
(a) Involuntary [½]. (b) Reflex arc [½]. (c) (i) Effector [½] (ii) Fore-brain [½].

Q31 **Very Short Answer** · 1 mark · ★ 1 paper

Sheila saw a snake and instantly jumped back. She then slowly moved away from the snake. What is the difference between the two actions of instantly jumping and walking away?

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q8 [F4 p737, key p739]

✔ Answer
The jump was an involuntary quick reflex action [½]. Walking away was a voluntary slow action [½].

Q32 **Very Short Answer** · 2 marks · ★ 1 paper

Raman's mother moved her leg immediately as she saw that she was about to step on Raman's toy. Netra says this action is a reflex action as it was a quick action whereas Kabir says it was a reflex action because it was an involuntary response. Is either of them CORRECT? Justify your answer.

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.123 [F6 p62, key p72]

✔ Answer
Neither of them is correct [1]. The action was a voluntary action in response to seeing the toy (the information went to the brain, which decided to move the leg) [1].

Short Answer

Q33 **Short Answer** · 3 marks · ★ **Board ×1** 2 papers

(a) Name the gland and the hormone secreted by it in scary situations in human beings. List any two responses shown by our body when this hormone is secreted into the blood.
OR
(b) In the given diagram (i) Name the parts labelled A, B, and C. (ii) Write the functions of A and C. (iii) Reflex arcs have evolved in animals. Why?

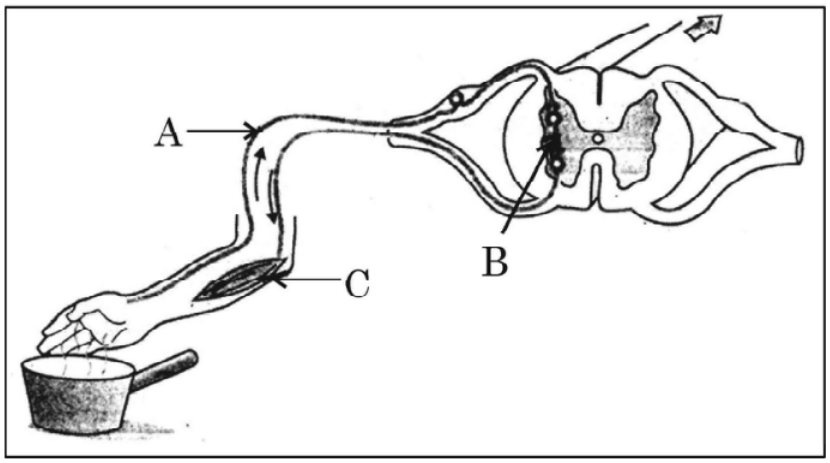


Figure from the question paper (CBSE 2023, 31/6/3 Q32)

Source
• CBSE 2023 · 31/6 (sets 1–3) — 31/6/1 Q29; 31/6/3 Q32 [F1 p555; F9-OCR p55]
• Practice paper F6-5 — Q12 [F6 p356, key p363]

✔ Answer
(a) Adrenal gland; adrenaline [1]. Heart beats faster, giving more oxygen to muscles; blood to digestive system and skin is reduced; breathing rate increases (any two) [2].
OR
(b) (i) A – sensory neuron, B – relay neuron (in spinal cord), C – effector: muscle in the arm [1]. (ii) A carries the impulse from the receptor (skin of the hand) to the spinal cord; C, the muscle, contracts and pulls the hand away from the hot object [1]. (iii) The thinking process of the brain is not fast enough for all situations; reflex arcs give a quick response [1].

⚠ **Note** Figure checked: same figure in 31/6/1 and 31/6/3. A – nerve going to the spinal cord (sensory neuron), B – inside the spinal cord (relay neuron), C – arm muscle (effector).

Q34 Short Answer · 3 marks · ★ Board ×1 — 1 paper

(a) What is meant by reflex arc? Where are they formed in the human body?
(b) Why have reflex arcs evolved in animals?

Source
• CBSE 2025 · 31/2 (sets 1–3) · GHF2E — 31/2/2 Q29 [F9 p422]

✔ Answer
(a) The connection (pathway) of nerves between the input nerve and the output nerve that brings about a reflex action is called a reflex arc [1]. Reflex arcs are formed in the spinal cord, where the input information reaches [1].
(b) The thinking process of the brain is not fast enough; reflex arcs give a quick response in the absence of true thought processes. Many animals have little or no complex neuron network for thinking, so reflex arcs are efficient ways of working [1].

Q35 Short Answer · 3 marks · ★ Board ×1 — 1 paper

(a) (i) What are the limitations of electrical impulses in multicellular organisms? (ii) In a 'Touch-me-not' plant, movement is seen on touch. Compare it with that of animals. (iii) Name the type of movement shown by the growth of pollen tube towards an ovule.
OR
(b) (i) Reflex arcs have evolved in animals because the thinking process of the brain is not fast enough for all situations. Draw a flow chart showing the path of a reflex arc. (ii) Given below are some actions/activities. Identify the part of brain involved in controlling them: (I) Taking a walk in the garden (II) Dancing (III) Blood pressure

Source
• CBSE 2026 · 31/7 (sets 1–3) · E7FDG — 31/7/1 Q16; 31/7/2 Q16; 31/7/3 Q16 [F4 p38, p53, p72]

✔ Answer
(a)(i) Impulses reach only those cells that are connected by nervous tissue, not each and every cell; once an impulse is generated, the cell takes some time to reset before it can generate a new impulse, so cells cannot continuously create and transmit impulses [1]. (ii) Plant cells change shape by changing the amount of water in them; animal muscle cells have special proteins that change shape and arrangement in response to nervous impulses. Plants have no specialised tissue for conduction of information [1]. (iii) Chemotropism [1].
OR
(b)(i) Receptor → Sensory neuron → Relay neuron (spinal cord) → Motor neuron → Effector (muscle) [1½]. (ii) (I) Cerebellum (hind-brain) (II) Cerebellum (III) Medulla (hind-brain) [½ × 3] (walking and dancing need precise voluntary movement, posture and balance – cerebellum; the decision to walk comes from the fore-brain).

⚠ **Note** (b)(ii) (I) and (II) – NCERT: walking in a straight line and precision of voluntary actions → cerebellum. Accept fore-brain (voluntary action) with cerebellum.

Q36 **Short Answer** · 3 marks · ★ 1 paper

The diagram shows a reflex arc with parts labeled P, Q and R.
(i) What are the functions of P, Q and R?
(ii) There is a small gap between R and P. Name this gap and describe the events at this point.

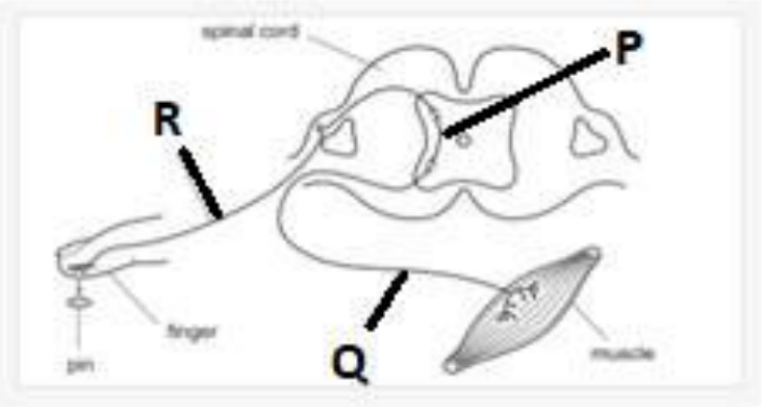


Figure from the question paper – Bangalore Sahodaya PB 2023-24 Set 1 Q29

Source
• Bangalore Sahodaya Pre-board 2023-24 (Set 1 + Set 2 key) — Set 1 Q29 [F5 p531]

✔ Answer
(i) R – sensory neuron: carries the impulse from the receptor (finger pricked by pin) to the spinal cord [½]. P – relay neuron in the spinal cord: passes the impulse from the sensory neuron to the motor neuron [½]. Q – motor neuron: carries the message from the spinal cord to the muscle, which contracts [½]. (ii) Synapse [½]. At the end of the axon the electrical impulse sets off the release of some chemicals; these cross the gap and start a similar electrical impulse in the dendrite of the next neuron [1].

Long Answer

Q37 Long Answer · 5 marks · ★ Board ×1 — 2 papers

(a) (i) Define a reflex arc. Why have reflex arcs evolved in animals? Trace the sequence of events which occur, when you suddenly touch a hot object.
(ii) Name the part of nervous system which helps in communication between the central nervous system and other parts of the body. What are the two components of this system?
OR
(b) (i) Leaves of chhui-mui plant begin to fold up and droop in response to a stimulus. Name the stimulus and write the cause for such a rapid movement. Is there any growth involved in the movement?
(ii) Define geotropism in plants. What is meant by positive and negative geotropism? Give one example of each type.

Source
- CBSE 2024 · 31/4/1 · D4CBA/4 — Q35 [F1 p397]
- Practice paper F6-10 — Q16 OR [F6 p432, key p439]

Also asked as: Practice F6-10 asks part (a) only.

✓ Answer
(a)(i) The connection between the input nerve and output nerve that brings about a reflex action is a reflex arc [1]. Reflex arcs evolved because the thinking process of the brain is not fast enough [1]. Touching a hot object: receptor in skin detects heat → sensory neuron carries the impulse to spinal cord → relay neuron → motor neuron → muscles of arm contract → hand is pulled back [1].
(ii) Peripheral nervous system [1]; cranial nerves arising from the brain and spinal nerves arising from the spinal cord [1].
OR
(b)(i) Stimulus – touch [½]. Cells change shape by changing the amount of water in them; this swelling or shrinking causes the leaves to fold [1]. No growth is involved [½].
(ii) Growth of plant parts in response to gravity is geotropism [1]. Positive – growth towards gravity, e.g. roots grow downwards [1]; negative – growth away from gravity, e.g. shoot grows upwards [1].

Case / Source-based

Q38 Case / Source-based · 4 marks · ★ — 1 paper

Nitu and Ria went for a routine health check. The doctor tapped the patellar tendon that is below the kneecap. Nitu showed a knee-jerk reaction but Ria didn't show any reaction.
(a) What does the lack of reaction in Ria indicate?
(b) If Ria sees a sharp object and does not step on it, what kind of action is it? Describe the neural path followed for this action.
(c) Write TWO points explaining the neural pathway followed for the knee-jerk reaction in Nitu.

Source
- CBSE Competency Focused Practice Qs (Vol 2) — Q.108 [F6 p59, key p70]

✓ Answer
(a) Possible damage to the nerves / spinal cord – a problem in the reflex arc [1].
(b) Voluntary action [½]; signal from the eyes goes to the brain; the brain sends the message through motor nerves to the leg muscles (effector) to move away [½ + ½ … 1½].
(c) Tapping the tendon starts a signal that goes through the sensory neuron to the spinal cord [½ … 1]; from the spinal cord the message goes through the motor neuron to the leg muscle, which moves [1].

Q39 Case / Source-based · 4 marks · ★ — 1 paper

Raghav was watching Nia and made the following observation: Nia was practicing boxing. As her opponent swung an arm, Nia blinked her eyes and ducked down. Nia retaliated with a punch.
(a) Raghav said that the blinking of eyes and ducking down are both reflex actions. Is he correct? Justify.
(b) Explain the nervous process involved in Nia's retaliation with a punch in TWO points.

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.141 [F6 p66, key p77]

✔ Answer
(a) CBSE key: Raghav is only partly correct – ducking down is a reflex action; the key treats blinking as an involuntary action that can happen with or without a stimulus [2].
(b) Nia's brain received the signal from the eyes through sensory nerves and processed it [1]. The brain sent the message through motor nerves to the muscles of the hand to punch back [1].

⚠ **Note** Key on blinking is debatable – blinking when something comes near the eye is a reflex. Discuss in class.

Q40 **Case / Source-based** · 3 marks · ★ 1 paper

Rahul, a 16-year-old student, was riding his bicycle when he suddenly saw a car approaching from the opposite direction. He immediately applied the brakes and steered his bicycle to the side to avoid the collision.
1. Which nervous system helped Rahul respond quickly to the situation?
2. What type of coordination enabled Rahul to apply the brakes and steer his bicycle simultaneously?
3. Which sensory organ helped Rahul detect the approaching car?

Source
• PM SHRI KV Sitapur Periodic Test-2 2024-25 — Q14 [FM p2]

✔ Answer
1. Nervous system – brain and spinal cord (central nervous system) with nerves (peripheral nervous system) [1]. 2. Nervous (muscular) coordination – the cerebellum keeps posture and balance and makes the voluntary actions precise [1]. 3. Eyes [1].

Animals – Nervous System · Human brain – parts and functions

24 questions · 26 papers · 11 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)

FORE-BRAIN	MID-BRAIN	HIND-BRAIN
main thinking part cerebrum: voluntary actions, hearing, smell, sight, memory hypothalamus: hunger	involuntary actions (with hind-brain)	cerebellum: posture, balance, precise voluntary actions medulla: blood pressure, salivation, vomiting · pons

Multiple Choice

Q41 **Multiple Choice** · 1 mark · ★★ **Board ×1** 4 papers

A man underwent MRI of brain which shows some defects in the cerebellum of his brain. Which activity of that person will be affected?

(A) Heart beat
(B) Feeling of hunger and thirst
(C) Reflexes
(D) Walking in straight line

Source
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/1 Q5; 31/8/2 Q4; 31/8/3 Q1 [F4 p95, p127, p157]
• CBSE Sample Paper 2024-25 — Q11 [F6 p447]
• KVS Lucknow Pre-board 2025-26 (paper B) — Q3 [FM p79]
• CBSE Competency Focused Practice Qs (Vol 2) — Q.96 [F6 p55, key p68]

Also asked as: "There was a cerebellar dysfunction in a patient. Which of the following activities will get disturbed? A. Salivation B. Hunger control C. Posture and balance D. Regulation of blood pressure" – Ans C (CBSE SQP 2024-25 Q11); "difficulty maintaining balance while walking – which part?" – Ans Cerebellum (KVS Lucknow PB 2025-26 B, Q3); CFPQ Q.96 "injured a part of the hindbrain" – key B, walking in a straight line (note: medulla, which regulates blood pressure, is also in the hind-brain).

✔ Answer
(D) Walking in straight line.

⚠ **Note** Q numbers of 31/8/1 and 31/8/2 are lost in the OCR (5 and 4 inferred from page order).

Q42 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

The part of human brain which controls muscular coordination is :

(A) medulla
(B) pons
(C) cerebrum
(D) cerebellum

Source
• CBSE VI Suppl. · 31(B)/S Set-5 (CDBA/S?) (yr?) — Q10 [F1 p7]
• KVS Lucknow Pre-board 2 2024-25 — Q11 [FM p21]

✔ Answer
(D) cerebellum.

Q43 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

Following are the statements about the different parts of the brain. Select the correct statements.
(i) The thinking part of the brain is the forebrain.
(ii) Centres for smell, hearing, memory, sight are located in forebrain.
(iii) Salivation, vomiting, blood pressure are controlled by medulla in the hind brain.
(iv) Cerebellum does not control the posture and balance of the body.

(A) (i), (ii) and (iii)
(B) (ii), (iii) and (iv)
(C) (i), (ii) and (iv)
(D) (i), (iii) and (iv)

Source
• CBSE 2026 · 31/4 (sets 1–3) — 31/4/1 Q5; 31/4/2 Q3 [F4 p368, p400]
• KVS Lucknow Monthly Test (30 marks) (yr?) — Q4 [FM p62]

Also asked as: (KVS Lucknow Monthly Test Q4): same statements but (i) "The main thinking part of brain is hindbrain" – options (a) i & ii (b) i, ii & iii (c) ii & iii (d) iii & iv → Ans (c) (ii) and (iii).

✔ Answer
(A) (i), (ii) and (iii). Statement (iv) is wrong – the cerebellum maintains posture and balance of the body.

⚠ **Note** Options read from the screenshots.

Q44 Multiple Choice · 1 mark · ★ Board ×1 — 1 paper

Walking in a straight line and riding a bicycle are the activities which are possible due to a part of the brain. Choose the correct location and name of this part from the given table :

(A) Fore brain – Cerebrum
(B) Mid brain – Hypothalamus
(C) Hind brain – Cerebellum
(D) Hind brain – Medulla

Source
• CBSE 2023 · 31/6 (sets 1–3) — 31/6/1 Q6; 31/6/2 Q15; 31/6/3 Q5 [F1 p541; F9-OCR p13, p39]

✔ **Answer**
(c) Hind brain – Cerebellum.

Q45 **Multiple Choice** · 1 mark · ★ **Board ×1** 1 paper

The part of the hindbrain present immediately above the medulla is

(A) Cerebellum
(B) Pons
(C) Cerebrum
(D) Spinal cord

Source
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/1 Q7; 31/S/2 Q2; 31/S/3 Q7 [F4 p218, p274, p330]

✔ **Answer**
(B) Pons.

⚠ **Note** Q numbers inferred from page order (lost in OCR).

Q46 **Multiple Choice** · 1 mark · ★ **Board ×1** 1 paper

The voluntary actions such as reading and writing are controlled by :

(A) cerebellum
(B) cerebrum
(C) medulla
(D) pons

Source
• CBSE VI · 31(B) · ZWYX (yr?) — Q11 [F9 p100]

✔ **Answer**
(b) cerebrum.

Q47 **Multiple Choice** · 1 mark · ★ 1 paper

Which of the following is a correct combination of function and part of the brain?

(A) Posture and balance: Cerebrum
(B) Salivation: Medulla in midbrain
(C) Hunger: Pons in hindbrain
(D) Blood pressure: Medulla in hindbrain

Source
• CBSE Sample Paper 2025-26 — Q3 [F5 p282; F6 p226; F8 key p319]

✔ **Answer**
(D) Blood pressure: Medulla in hindbrain.

Q48 **Multiple Choice** · 1 mark · ★ 1 paper

Body temperature in human beings is regulated by which part of the brain?

(A) Pituitary
(B) Cerebellum
(C) Hypothalamus
(D) Medulla

Source
• Practice sample paper, set 2 — Q11 [F5 p315, key p328]

✔ **Answer**
(c) Hypothalamus.

⚠ **Note** Body temperature control is not in the NCERT text; hypothalamus is named in NCERT Fig. 6.3.

Q49 **Multiple Choice** · 1 mark · ★ 1 paper

Respiration is controlled by which of the following?

(A) cerebellum
(B) pons
(C) medulla
(D) all of these

Source
• KV Sitapur PT-II (yr?) — Q2 [FM p10]

✔ Answer
(c) medulla.

⚠ **Note** Beyond NCERT wording (NCERT lists blood pressure, salivation and vomiting for medulla). No key in file.

Q50 Multiple Choice · 1 mark · ★ 1 paper

The cerebellum in the brain controls voluntary actions of the body. Which of these actions is controlled by the cerebellum?

(A) Beating of the heart
(B) Blinking of the eyes
(C) Watering of the mouth
(D) Jumping from a height

Source
• CBSE Competency Item Bank 2021 (SAS) — Item 9 (SAS21S100709) [F5 p410, key p465]

✔ Answer
(D) Jumping from a height.

Q51 Multiple Choice · 1 mark · ★ 1 paper

Match the following with correct response.
Column A: (i) The largest part of the brain (ii) The protective covering of the brain (iii) Forebrain (iv) Cerebellum
Column B: (a) Cranial meninges (b) Spinal cord (c) Olfactory lobe (d) Cerebrum

Source
• Practice paper F6-5 — Q3 [F6 p354, key p362]

✔ Answer
Key: (i)-(d), (ii)-(a), (iii)-(c), (iv)-(b).

⚠ **Note** Flawed item: (iv) Cerebellum – (b) Spinal cord is not a true match. Keep only for revision of terms.

Very Short Answer

Q52 Very Short Answer · 2 marks · ★ Board ×2 2 papers

(A) Name the part of brain which is responsible for the following actions : (i) Maintaining posture and balance (ii) Beating of heart (iii) Thinking (iv) Blood pressure
OR
(B) Where are auxins synthesized in a plant? Which organ of the plant shows : (i) Positive phototropism (ii) Negative geotropism (iii) Positive hydrotropism

Source
• CBSE 2023 · 31/4 (sets 1–3) · Z1XYW/4 — 31/4/1 Q22 [F1 p365]
• CBSE VI · 11-31(B) Set-5 (yr?) — Q26 [F9 p137]

Also asked as: (CBSE VI 11-31(B) Q26): (a) name the part for (i) Thinking (ii) Blood pressure (iii) Maintaining posture and balance (iv) Salivation – OR (b) organ showing positive hydrotropism, positive phototropism, negative geotropism, positive chemotropism (pollen tube).

✔ Answer
(A) (i) Cerebellum (ii) Medulla (iii) Cerebrum (fore-brain) (iv) Medulla [½ × 4].
OR
(B) At the shoot tip [½]. (i) Shoot/stem [½] (ii) Shoot/stem [½] (iii) Root [½].

Q53 Very Short Answer · 2 marks · ★ Board ×1 — 2 papers

A person is making a list to purchase few things from a nearby market. Explain how the fore-brain plays an important role in performing this activity.

Source
• CBSE 2025 · 31/2 (sets 1–3) · GHF2E — 31/2/3 Q23 [F9 p490]
• PM SHRI KV Sitapur Periodic Test-2 2025-26 — Q12 [FM p69]

✔ Answer
Fore-brain is the main thinking part of the brain [½]. It has regions that receive sensory impulses from receptors and separate areas for hearing, sight, etc. [½]. It also has regions where information is put together, processed with information stored (memory), and decisions are made – here remembering what is needed and writing it [½]. It sends messages to muscles for the voluntary action of writing [½].

Q54 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(a) In the diagram given below, name the labelled parts X and Y. Mention one function for each.
OR
(b) Name the parts of the nervous system which are involved in the following activities : (i) Maintaining body posture (ii) Salivation (iii) Hunger (iv) Answering a question

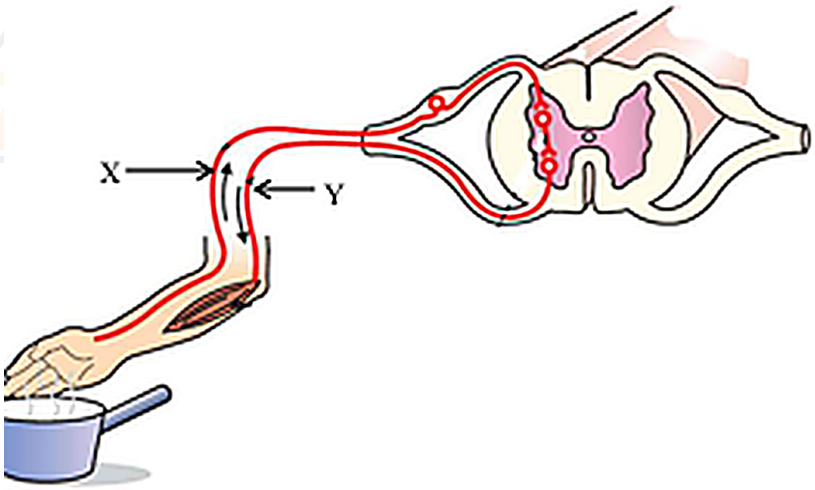


Figure from the question paper (teacher's screenshot, enhanced) – CBSE Suppl. 31/S/1 Q23

Source
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/1 Q23; 31/S/2 (OR part); 31/S/3 Q24 [F4 p197, p255, p309]

✔ Answer
(a) The figure is a reflex arc (hand touching a hot pan). X – sensory neuron: carries the impulse from the receptor in the skin to the spinal cord [1]. Y – motor neuron: carries the message from the spinal cord to the muscle (effector) of the arm [1].
OR
(b) (i) Cerebellum (ii) Medulla (iii) Hypothalamus (fore-brain) (iv) Cerebrum (fore-brain) [½ × 4].

Q55 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(a) How is brain protected in our body?
(b) A doctor finds in one of his patients that he is not maintaining a proper posture and balance of his body. State the region of brain and also the part of brain which is responsible for it.

Source
• CBSE 2025 · 31/6/3 · GF6HE — Q25 [F4 p17]

✔ Answer
(a) The brain sits inside a bony box (skull); inside the box it is contained in a fluid-filled balloon which gives further shock absorption [1]. (b) Hind-brain [½]; cerebellum [½].

Q56 **Very Short Answer** · 2 marks · ★ **Board ×1** 1 paper

Name the parts of hind-brain of the human brain. Which part of the hind-brain controls involuntary actions such as blood pressure and salivation?

Source
• CBSE 2025 · 31/2 (sets 1–3) · GHF2E — 31/2/1 Q23 [F9 p352]

✔ Answer
Pons, cerebellum and medulla [1]. Medulla [1].

Q57 **Very Short Answer** · 2 marks · ★ 1 paper

Given below are some disorders noticed in some patients. It could be due to malfunctioning of which part of brain?
(i) Lowered ability to salivate
(ii) Difficulty in maintaining posture and balance in body.

Source
• PM SHRI KV Sitapur Periodic Test-2 2025-26 — Q14 [FM p69]

✔ Answer
(i) Medulla (hind-brain) [1] (ii) Cerebellum (hind-brain) [1].

Q58 **Very Short Answer** · 2 marks · ★ 1 paper

Raj is blindfolded. He is made to taste the food without seeing it. He concludes that the food is burnt.
(a) What specific component of the tongue helped him conclude the taste of the food?
(b) If the food was crunchy, which part of the brain would help him recognise this texture of the food?

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.142 [F6 p66, key p77]

✔ Answer
(a) Gustatory receptors (taste receptors) on the tongue [1]. (b) Fore-brain – it has separate areas for hearing, and the crunch is heard [1].

Short Answer

Q59 **Short Answer** · 3 marks · ★ **Board ×1** 1 paper

Name the parts 'X' and 'Y' of human brain in the given diagram and give one function of each.

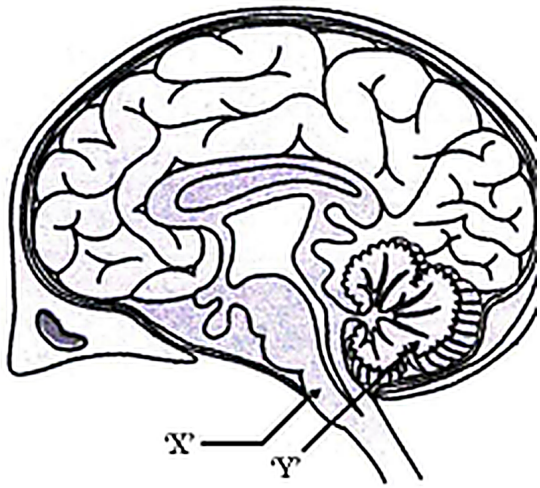


Figure from the question paper (teacher's screenshot, enhanced) – CBSE Suppl. 31/S/2 Q29

Source
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/2 Q29 [F4 p284]

✔ Answer
X – Medulla (hind-brain): controls involuntary actions such as blood pressure, salivation and vomiting [1½]. Y – Cerebellum (hind-brain): responsible for precision of voluntary actions and for maintaining the posture and balance of the body [1½].

⚠ **Note** Labels read from the figure: X points to the brain stem below the pons (medulla); Y points to the cerebellum. Accept "pons" for X if the marking scheme says so.

Long Answer

Q60 Long Answer · 5 marks · ★ 1 paper

Given below is a labelled diagram of the human brain. Using the given diagram, answer the following questions:
i. Which part of the brain controls reflex movements of the head, neck, and trunk?
ii. Name the part of the human brain which contains a vital centre for controlling blood pressure.
iii. Which part of the hindbrain regulates respiration?
iv. How is the brain protected from injuries and shock?
v. Which part of the human brain is the main thinking region?

▣ **Figure in the question paper:** Labelled diagram of human brain. *(screenshot requested – see teacher's list)*

Source
• Practice paper F8-g — Q35 OR [F8 p104, key p112]

✔ Answer
i. Mid-brain (key) [1]. ii. Medulla [1]. iii. Pons (key) [1]. iv. Bony box (skull/cranium); inside it the brain is in a fluid-filled balloon (key: meninges) which absorbs shocks [1]. v. Fore-brain (cerebrum) [1].

⚠ **Note** (i) and (iii) are beyond NCERT text.

Q61 Long Answer · 5 marks · ★ 1 paper

State the role played by each of these parts of the human brain: (a) Medulla oblongata (b) Olfactory lobes (c) Cerebellum (d) Hypothalamus (e) Cerebrum

Source
• Practice sample paper, set 1 — Q35 OR [F4 p575, key p589]

✔ Answer
(a) Medulla – controls involuntary actions such as blood pressure, salivation and vomiting. (b) Olfactory lobes – smell. (c) Cerebellum – precision of voluntary actions; posture and balance. (d) Hypothalamus – key: body temperature, urge to eat and drink (hunger). (e) Cerebrum – main thinking part; voluntary actions, memory, centres for hearing, sight, smell. [1 × 5]

Case / Source-based

Q62 Case / Source-based · 4 marks · ★ Board ×1 — 1 paper

Read the following passage and answer the questions that follow :
A middle-aged person is facing some cognitive changes in himself. His early symptoms included mild forgetfulness. For example, forgetting where he left his mobile or failing to find words to complete his sentences. He was facing problems in driving a car, climbing up and down the stairs, inserting a plug into an outlet. He slowly developed a sad mood and anxiety.
(a) What are voluntary actions? (1)
(b) Which part of the brain is responsible for precision of voluntary actions? (1)
(c) (i) Explain the role of the medulla. (2)
OR
(c) (ii) How do the animal muscles move? (2)

Source
• CBSE 2026 · 31/2 (sets 1–3) · LMNK2 — 31/2/1 Q15; 31/2/2 Q16; 31/2/3 Q15 [F9 p317, p389, p457]

✔ Answer
(a) Actions done by our will, after thinking (e.g. writing, talking, moving a chair) [1]. (b) Cerebellum [1].
(c)(i) Medulla in the hind-brain controls involuntary actions such as blood pressure, salivation and vomiting [2].
OR (c)(ii) Muscle cells have special proteins that change both their shape and their arrangement in the cell in response to nervous electrical impulses. When this happens, new arrangements of these proteins give the muscle cells a shorter form, and the muscle contracts [2].

Q63 Case / Source-based · 4 marks · ★ — 1 paper

Read the text carefully and answer the questions:
We have seen that the different parts of our body have specific functions. Our mouth waters when we see the food we like without our meaning to. Our heart's beat without our thinking about it. ... Many of these involuntary actions are controlled by the mid-brain and hind-brain. All these involuntary actions including blood pressure, salivation and vomiting are controlled by the medulla in the hind-brain. Think about activities like walking in a straight line, riding a bicycle, picking up a pencil. These are possible due to a part of the hind-brain called the cerebellum. It is responsible for the precision of voluntary actions and maintaining the posture and balance of the body.
(Questions on involuntary actions, reflex action, medulla and cerebellum.)

Source
• Practice paper F8-b — Q38 [F8 p24, key p32–33]

✔ Answer
Key points: involuntary actions (heart beat, salivation) are controlled by mid-brain and hind-brain; medulla controls blood pressure, salivation and vomiting; cerebellum – precision of voluntary actions, posture and balance. OR part: "Beating of heart muscle" is an example of involuntary action; reflex action is controlled by the spinal cord.

⚠ **Note** Sub-questions (i)–(iii) are missing in the text layer (only answers seen). Screenshot needed. Key line "reflex action involves all parts of the voluntary nervous system" is wrong – not used.

Q64 Case / Source-based · 4 marks · ★ — 1 paper

The diagram shows a section of the human brain labelled as A, B, C and D. Observe the diagram carefully and answer the questions.
a) Identify A, B, C and D.
b) What are nerves and their function in body?
c) List two body functions that will be affected if cerebellum gets damaged.
OR
Name two specialised tissue that provide control and coordination in multicellular organisms.

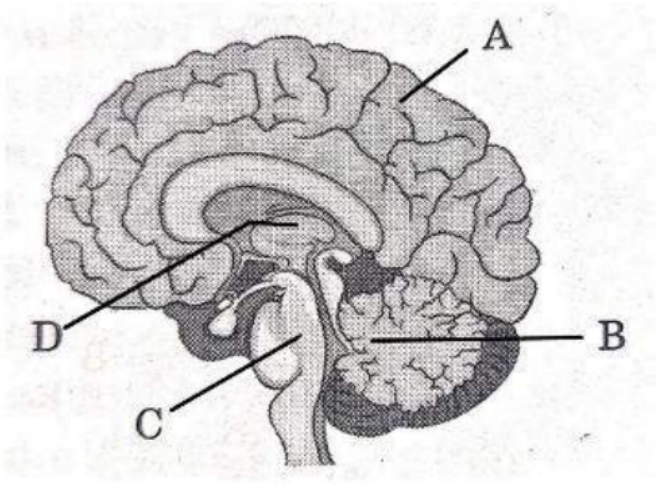


Figure from the question paper – KVS Raipur PB-II 2025-26 Q37

Source
• KVS Raipur Pre-board II 2025-26 — Q37 (two copies) [F5 p302, p308]

✓ Answer
a) A – cerebrum (fore-brain), B – cerebellum, C – pons / medulla (brain stem, hind-brain), D – mid-brain region (below the fore-brain) [1]. b) Nerves are bundles of nerve fibres (axons of neurons); they carry messages (electrical impulses) between the brain/spinal cord and all parts of the body [1]. c) Precision of voluntary actions such as walking in a straight line, riding a bicycle, picking up a pencil; posture and balance of the body [2].
OR Nervous tissue and muscular tissue [2].

⚠ **Note** Labels read from the figure. D points to the middle of the brain under the cerebrum; accept mid-brain / hypothalamus as per the school key.

Animals – Nervous System · Protecting the brain and spinal cord; CNS, PNS; limits of electrical impulses

8 questions · 16 papers · 8 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)

CNS = brain + spinal cord	Brain: bony box (skull) + fluid-filled balloon	Spinal cord: vertebral column
PNS = cranial nerves + spinal nerves	Limits of electrical impulses: reach only cells joined by nerves; cell needs time to reset before the next impulse	

Multiple Choice

Q65 Multiple Choice · 1 mark · ★ 1 paper

Spinal cord originates from:

(A) cerebellum
(B) pons
(C) medulla
(D) cerebrum

Source
• Practice paper F6-2 — Q7 [F6 p274, key p281]

✔ Answer
(c) medulla.

Q66 Multiple Choice · 1 mark · ★ 1 paper

Match the following with correct response.
Column A: (i) Central nervous system (ii) Peripheral nervous system (iii) Autonomic nervous system (iv) Reflex action
Column B: (a) Brain (b) Sympathetic nervous system (c) Cranial and spinal nerves (d) Reflex arc

Source
• Practice paper F6-3 — Q4 [F6 p305, key p313]

✔ Answer
(i)-(a), (ii)-(c), (iii)-(b), (iv)-(d).

⚠ **Note** Autonomic / sympathetic nervous system is beyond NCERT.

Q67 Multiple Choice · 1 mark · ★ 1 paper

Which tissue is responsible for movement in our body?

(A) Blood tissue
(B) Muscle tissue
(C) Nervous tissue
(D) Connective tissue

Source
• Sample Question Paper Set 7 — Q16 [F4 p670]

✔ Answer
(b) Muscle tissue.

Very Short Answer

Q68 Very Short Answer · 2 marks · ★★ Board ×4 4 papers

(a) Electrical impulses are an excellent means to respond to stimuli in animal bodies. List any two limitations to the use of electrical impulses.
OR
(b) Explain how the pea plant climbs up the support by means of tendrils.

Source
• CBSE VI · 31(B) · LMNK2 (2026) — Q11 [F1 p63]
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/1 Q24; 31/S/2 Q26; 31/S/3 Q26 [F4 p224, p282, p336]
• CBSE 2026 · 31/2 (sets 1–3) · LMNK2 — 31/2/1 Q10(b); 31/2/2 Q10(b); 31/2/3 Q10(b) [F9 p315, p385, p455]
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/3 Q11 [F4 p161]

Also asked as: "Discuss two limitations to the use of electrical impulse for coordination, by animals" (CBSE 2026 31/8/3 Q11); 2026 31/2 Q10 pairs part (b) with "timing and amount of hormone … justify with example" (see Theme C).

✔ Answer
(a) Impulses reach only those cells that are connected by nervous tissue, not each and every cell [1]; after an impulse the cell takes some time to reset before it can generate and transmit a new impulse, so cells cannot continually create and transmit impulses [1].
OR
(b) Tendrils are sensitive to touch [½]. When they come in contact with a support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object [1]. This causes the tendril to circle around the object and cling to it [½].

Q69 Very Short Answer · 1 mark · ★ Board ×1 — 2 papers

How is the spinal cord protected in the human body?

Source
- CBSE old pattern · 31/1/1 · LRH/1 (60 marks) (yr? (pre-2010)) — Q20 (two copies) [6_merged OCR, LRH/1 p13]
- KVS Lucknow Monthly Test (30 marks) (yr?) — Q8 [FM p64]

Also asked as: "How is human brain protected from mechanical injuries and shocks?" (KVS Lucknow Monthly Test Q8) – Ans: bony box (skull) and fluid-filled balloon for shock absorption.

✔ Answer
The spinal cord is protected by the vertebral column (backbone).

Q70 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(a) How is the brain and spinal cord protected in human beings?
(b) State one main function each of (i) Medulla and (ii) Cerebellum.

Source
- CBSE 2023 · 31/5 (sets 1–3) · Z1XYW — 31/5/3 Q21 [F1 p522]

✔ Answer
(a) Brain – inside a bony box (skull), in a fluid-filled balloon for shock absorption; spinal cord – inside the vertebral column (backbone) [1]. (b) (i) Medulla – controls involuntary actions like blood pressure, salivation and vomiting [½]. (ii) Cerebellum – precision of voluntary actions; posture and balance [½].

Short Answer

Q71 Short Answer · 3 marks · ★★ Board ×2 — 5 papers

(a) List two constituents of Central Nervous System (CNS). How are these components protected?
(b) Write two limitations of the use of electrical impulses.

Source
- CBSE VI Suppl. · 31(B)/S · EFGH/S (yr?) — Q30 [F1 p44]
- CBSE 2024 · 31/3 (sets 1–3) · DAA1B — 31/3/1 Q30; 31/3/2 Q29 [F1 p279, p309]
- KVS Ahmedabad Pre-board 2025-26 (Sets A, B) — Set A Q13; Set B Q13 [F9 p506, p518]
- Practice paper F6-9 — Q16 OR [F6 p416, key p425]
- Practice paper F6-5 — Q16 OR (iii) [F6 p357, key p364]

Also asked as: "What constitutes the central and peripheral nervous systems? How are the components of central nervous system protected? Which signals will get disrupted in case of a spinal cord injury?" (Practice F6-9 Q16 OR); "How is brain and spinal-cord protected against mechanical injuries?" (Practice F6-5 Q16 OR iii).

✔ Answer
(a) Brain and spinal cord [1]. The brain sits inside a bony box (skull) and is contained in a fluid-filled balloon which gives further shock absorption; the spinal cord is protected by the vertebral column (backbone) [1].
(b) Electrical impulses reach only those cells that are connected by nervous tissue, not each and every cell in the body; once an electrical impulse is generated in a cell and transmitted, the cell takes some time to reset its mechanisms before it can generate and transmit a new impulse – cells cannot continually create and transmit impulses [½ + ½].

Case / Source-based

Q72 Case / Source-based · 4 marks · ★ 1 paper

While riding a bicycle, your brain sends signals to your legs to start pedaling and receives messages from your eyes about the road ahead. Which part of the nervous system is responsible for carrying these signals between the brain and the rest of the body?

Source
• Bangalore Sahodaya Pre-board 1 2025-26 (Set 3) — Q16 OR (b) [F5 p548]

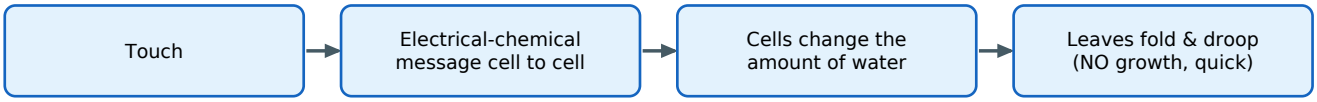
✔ Answer
Peripheral nervous system – cranial nerves arising from the brain and spinal nerves arising from the spinal cord.

⚠ **Note** Part of a 5-mark OR question; marks for this part not printed.

Coordination in Plants · Immediate response to stimulus (touch-me-not)

6 questions · 8 papers · 3 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)



Multiple Choice

Q73 Multiple Choice · 1 mark · ★ Board ×1 2 papers

Observe the given figures A and B. When chhui-mui (sensitive) plant is touched, its leaves fold. This is due to :

(A) Hormonal effect
(B) Thermal effect
(C) Change in amount of water in cells
(D) Electromagnetic effect



Figure from the question paper (KV Sitapur PT-2 2025-26 copy of the same question)

Source
• CBSE 2025 · 31/2 (sets 1–3) · GHF2E — 31/2/1 Q8; 31/2/2 Q10; 31/2/3 Q7 [F9 p344, p414, p484]
• PM SHRI KV Sitapur Periodic Test-2 2025-26 — Q4 [FM p68]

✔ Answer
(C) Change in amount of water in cells. Plant cells change shape by changing the amount of water in them, resulting in swelling or shrinking.

Very Short Answer

Q74 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

The sensitive plant shows movement of leaves in response to touch. Explain such movement briefly.

Source
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/2 Q11; 31/8/3 Q10 [F4 p129, p161]

✔ Answer
The plant uses electrical-chemical means to convey the information of touch from cell to cell [½]. There is no specialised tissue for conduction of information [½]. For the leaves to move, the plant cells change shape by changing the amount of water in them, resulting in swelling or shrinking, and the leaves fold up and droop [1]. No growth is involved.

Q75 Very Short Answer · 2 marks · ★ — 2 papers

Coiling of a pea plant tendril and the closing of leaves in a touch-me-not plant both appear as responses to stimuli. How do these two responses differ in terms of their causes and the mechanisms involved?

Source
• Bangalore Sahodaya Pre-board 1 2025-26 (Set 3) — Q12 [F5 p547]
• Practice paper F8-d — Q35 OR [F8 p55, key p63]

Also asked as: "drooping of leaves in touch-me-not and attaching of pea plant to a support with tendrils – (i) common stimulus (ii) difference (iii) scientific terms" (Practice F8-d Q35 OR – Ans: touch; growth-independent vs growth-related).

✔ Answer
Tendril coiling – caused by growth: the part of the tendril in contact with the support grows slowly and the part away from it grows faster, so the tendril circles round the support (slow, directional) [1].
Touch-me-not – no growth: touch is conveyed by electrical-chemical means from cell to cell and the cells change shape by changing the amount of water in them (quick) [1].

Short Answer

Q76 Short Answer · 3 marks · ★ Board ×1 — 1 paper

Plants have neither a nervous system nor muscles, even then they respond to stimuli. For example, the leaves of chhui-mui (touch-me-not) plant when touched begin to fold up and droop.
(a) How is the information communicated in "touch-me-not" plants?
(b) What enables the plant cells to bring out the observable response?
(c) Differentiate the movement mentioned above from the movement of tendrils in a pea plant.

Source
• CBSE 2025 · 31/1 (sets 1–3) · 1GEFH — 31/1/1 Q29 [F9 p198]

✔ Answer
(a) The plant cells use electrical-chemical means to convey the information from cell to cell [1]. (b) Plant cells change shape by changing the amount of water in them, resulting in swelling or shrinking [1]. (c) Touch-me-not: movement is quick and not related to growth; tendril: movement is due to growth – the part of the tendril away from the support grows faster, so it is slow and directional [1].

Case / Source-based

Q77 Case / Source-based · 4 marks · ★ — 1 paper

Mohan and Rohit observed that shoots of a plant growing in shade bend towards the sunlight. Whereas, leaves of 'Touch me not' plant fold and droop soon after touching. They were curious to know how these movements occur in plants.
(Figure A: shoots of a plant bending towards light; Figure B: folding of leaves of Touch me not plant)
Attempt either subpart A or B.
A. What causes the bending of shoots in the plants as shown in figure A?
OR
B. What causes the folding of the leaves in 'Touch me not' plant as shown in figure B? (2)
C. Compare the movement of growth of the pollen tube towards ovule with the movements shown in part A of the figure. (1)
D. Compare the movement in folding of leaves of 'Touch me not' plant with the movement of body parts in the animals. (1)

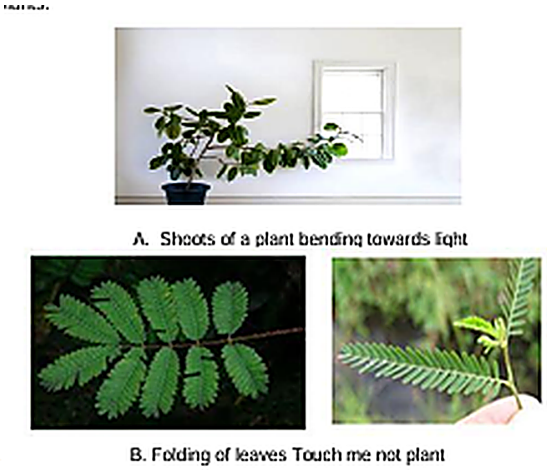


Figure from the question paper (teacher's screenshot, enhanced) – CBSE SQP 2024-25 Q38

Source
• CBSE Sample Paper 2024-25 — Q38 [F6 p458–459, key p471–472]

✔ Answer
A. Bending of the shoot is a directional, growth-related movement [½]. Auxin, synthesised at the shoot tip, helps the cells to grow longer [½]. When light comes from one side, auxin diffuses towards the shady side of the shoot [½]; this makes the cells on the side away from light grow longer, so the plant appears to bend towards light [½].
OR B. The leaves respond to touch; the information is conveyed from cell to cell by electrical-chemical means [1]; the cells change shape by changing the amount of water in them, which causes the leaves to fold [1].
C. Both are growth-related directional (tropic) movements – the pollen tube grows towards a chemical (chemotropism), the shoot towards light (phototropism) [1].
D. Both plants and animals use electrical-chemical means, but plants have no specialised tissue for conduction of information; animal muscle cells change shape using special proteins, whereas plant cells change shape by changing the amount of water in them [1].

Q78 **Case / Source-based** · 4 marks · ★ 1 paper

Read the text carefully and answer the questions:
Animals have a nervous system for controlling and coordinating the activities of the body. But plants have neither a nervous system nor muscles. So, how do they respond to stimuli? When we touch the leaves of a chui-mui (the 'sensitive' or 'touch-me-not' plant of the Mimosa family), they begin to fold up and droop. When a seed germinates, the root goes down, the stem comes up into the air. ... There is no growth involved in this movement. On the other hand, the directional movement of a seedling is caused by growth.
(a) Write the types of movement.
(b) Give an example of a plant hormone that promotes growth.
(c) What is the function of the nervous system?
OR How is the movement of leaves of the sensitive plant different from the movement of a shoot towards light?

Source
• Practice paper F6-11 — Q38 [F6 p479, key p488]

✔ Answer
(a) Movement independent of growth (immediate response to stimulus) and movement due to growth (tropic movement) [1]. (b) Auxin (or gibberellin) [1]. (c) To control and coordinate the activities of the body [2].
OR Leaves of the sensitive plant move quickly in response to touch and no growth is involved; the shoot bends towards light because of growth (phototropism) [2].

Coordination in Plants · Movement due to growth – tropisms and tendrils

22 questions · 25 papers · 8 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)

Light	Gravity	Water	Chemicals	Touch
shoot bends towards: + root bends away: –	root grows down: + shoot grows up: –	root grows towards water	pollen tube → ovule	tendril coils: far side grows faster
Phototropism	**Geotropism**	**Hydrotropism**	**Chemotropism**	**Growth movement**

Multiple Choice

Q79 **Multiple Choice** · 1 mark · ★★ **Board ×1** 5 papers

Identify the type of tropic movement that is responsible for the movement of the pollen tube towards an ovule from the following options.

(A) Hydrotropism
(B) Geotropism
(C) Chemotropism
(D) Phototropism

Source
• CBSE 2026 · 31/2 (sets 1–3) · LMNK2 — 31/2/1 Q2; 31/2/2 Q3; 31/2/3 Q3 [F9 p309, p381, p451]
• PM SHRI KV Sitapur Periodic Test-2 2025-26 — Q5 [FM p68]
• CBSE Competency Focused Practice Qs (Vol 1) — Q4 [F4 p736]
• Practice sample paper, set 2 — Q12 [F5 p315, key p328]
• Practice sample paper, set 4 — Q12 [F5 p353, key p366]

Also asked as: "During pollination, plants ensure that the pollen grain from a species germinates on the stigma of the same species. Which of the following ensures this? Hydrotropism / Chemotropism / Phototropism / Geotropism" – Ans Chemotropism (CFPQ Q4; practice sets 2 and 4 Q12).

✔ Answer
(C) Chemotropism.

Q80 **Multiple Choice** · 1 mark · ★ **Board ×1** 2 papers

Select from the following the correct statement about tropic movement in plants :

(A) It is due to stimulus of touch and temperature.
(B) It does not depend upon the direction of stimulus received.
(C) It is observed only in roots and not in stems.
(D) It is a growth related movement.

Source
• CBSE 2023 · 31/1 (sets 1–3) · Z1XYW — 31/1/1 Q11; 31/1/2 Q9; 31/1/3 Q11 [F1 p92, p124, p158]
• Practice paper F6-3 — Q6 [F6 p306, key p313]

✔ Answer
(d) It is a growth related movement.

Q81 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

The growth of tendril in pea plant is due to which of the following?

(A) Effect of chemotropism
(B) Effect of gravity
(C) Rapid growth of part of the tendril away from the point of contact with the support (object)
(D) Rapid growth of the part of the tendril in contact with the support (object)

Source
• CBSE 2026 · 31/7 (sets 1–3) · E7FDG — 31/7/1 Q3; 31/7/3 Q1 (nos. inferred) [F4 p35, p66]
• CBSE Competency Focused Practice Qs (Vol 2) — Q.93 [F6 p54–55, key p67]

Also asked as: Also asked as CFPQ Q.93: "When are tendrils likely to grow rapidly?" – Ans D. When the tendril is in contact with a surface.

✔ Answer
(C) Rapid growth of part of the tendril away from the point of contact with the support.

Q82 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

The movement of sunflowers is in response to a stimulus such as

(A) gravity
(B) chemicals
(C) day or night
(D) water

Source
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/1 Q10 [F4 p191]
• KVS Lucknow First Pre-board 2024-25 — Q15 [FM p30]

Also asked as: "The movement of sunflower in accordance with the path of Sun is due to – (a) phototropism (b) geotropism (c) chemotropism (d) hydrotropism" – Ans (a) (KVS Lucknow First PB 2024-25 Q15).

✔ Answer
(C) day or night (i.e. light – the sunflower responds to sunlight).

Q83 Multiple Choice · 1 mark · ★ — 2 papers

A big tree falls in a forest, but its roots are still in contact with the soil. The branches of this fallen tree grow straight up (vertically). This happens in response to:

(A) Water and light
(B) Water and minerals
(C) Gravity and water
(D) Light and gravity

Source
• KVS Lucknow 1st Pre-board (yr?) — Q11 [FM p53–54]
• KVS Delhi Pre-board II 2024-25 — Q7 [FM p86]

✔ **Answer**
(d) Light and gravity (positive phototropism and negative geotropism of the shoot).

Q84 **Multiple Choice** · 1 mark · ★ 1 paper

Roots of plants are:

(A) positively geotropic
(B) negatively geotropic
(C) positively phototropic
(D) None of these

Source
• KVS Lucknow Set-1 paper (yr?) — Q6 [FM p47]

✔ **Answer**
(a) positively geotropic.

Q85 **Multiple Choice** · 1 mark · ★ 1 paper

Match the following with correct response.
Column A: (i) The response of a plant to light (ii) The response of a plant to gravity (iii) The response of a plant to water (iv) The response of a plant to chemicals
Column B: (a) Phototropism (b) Hydrotropism (c) Geotropism (d) Chemotropism

(A) (i)-(a), (ii)-(c), (iii)-(b), (iv)-(d)
(B) (i)-(d), (ii)-(a), (iii)-(c), (iv)-(b)
(C) (i)-(b), (ii)-(d), (iii)-(a), (iv)-(c)
(D) (i)-(c), (ii)-(b), (iii)-(d), (iv)-(a)

Source
• Practice paper F6-1 (two copies) — Q4 [F6 p257, key p265]

✔ **Answer**
(a) (i)-(a), (ii)-(c), (iii)-(b), (iv)-(d).

Q86 **Multiple Choice** · 1 mark · ★ 1 paper

Pneumatophores are a special type of root found in mangrove trees. They help the trees by absorbing oxygen needed for the process of respiration in the roots. Choose the statement/s that is/are TRUE about the movement exhibited by pneumatophores.
P) They show negative geotropism as they grow against gravity.
Q) They show positive phototropism to absorb sunlight.
R) They show positive geotropism as the roots grow below the ground.

(A) Only P
(B) Only Q
(C) Both P & Q
(D) Both Q & R

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.94 [F6 p55, key p67]

✔ **Answer**
A. Only P.

Q87 **Multiple Choice** · 1 mark · ★ 1 paper

Identify the example that BEST describes a response to a stimulus.

(A) Absorption of sunlight by chloroplast
(B) Germination of pollen grains on the stigma
(C) Absorption of nutrients from the soil through root hairs
(D) Transportation of water and nutrients through the xylem

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.95 [F6 p55, key p67]

✔ Answer
B. Germination of pollen grains on the stigma (pollen tube grows towards the ovule – chemotropism).

Q88 Multiple Choice · 1 mark · ★ 1 paper

The two pictures below illustrate tropism in plants. P shows a plant bending towards light. Q shows a plant twining around a pole. Based on the pictures, what is true about the growth rate of the plant cells on the side away from the stimulus as compared to the growth rate of the plant cells on the side towards the stimulus?

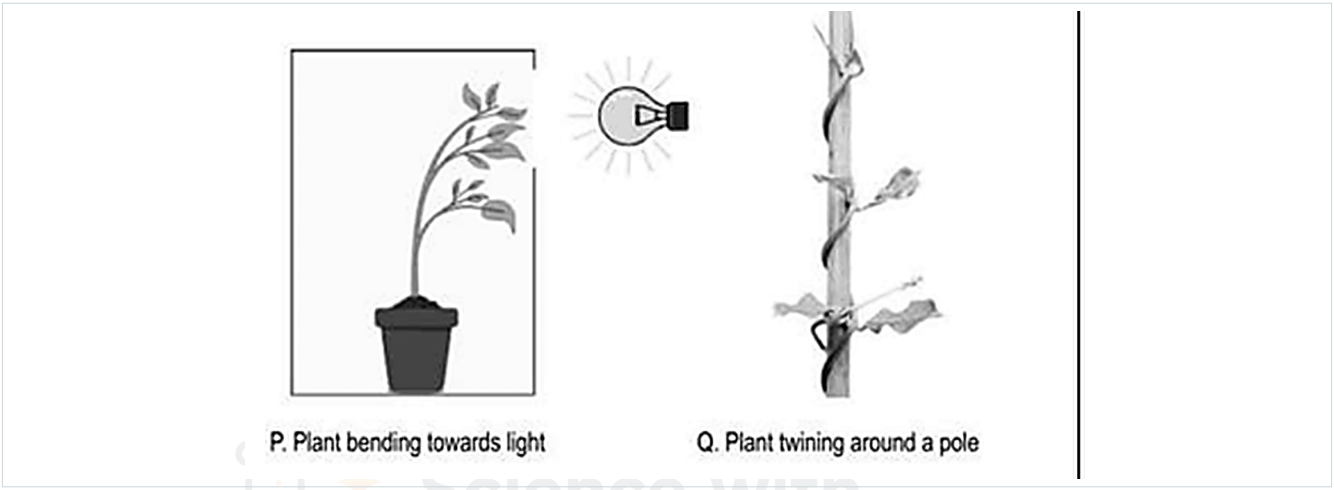


Figure from the question paper (teacher's screenshot, enhanced) – CBSE CFPQ Q.117

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.117 [F6 p61, key p72]

✔ Answer
The cells on the side away from the stimulus grow faster than the cells on the side of the stimulus.

Q89 Multiple Choice · 1 mark · ★ 1 paper

The figure shows the movement of a stem. How can the movement of the stem in a particular direction be described?

(A) Against gravity
(B) Away from touch
(C) Away from chemicals
(D) Towards a source of water

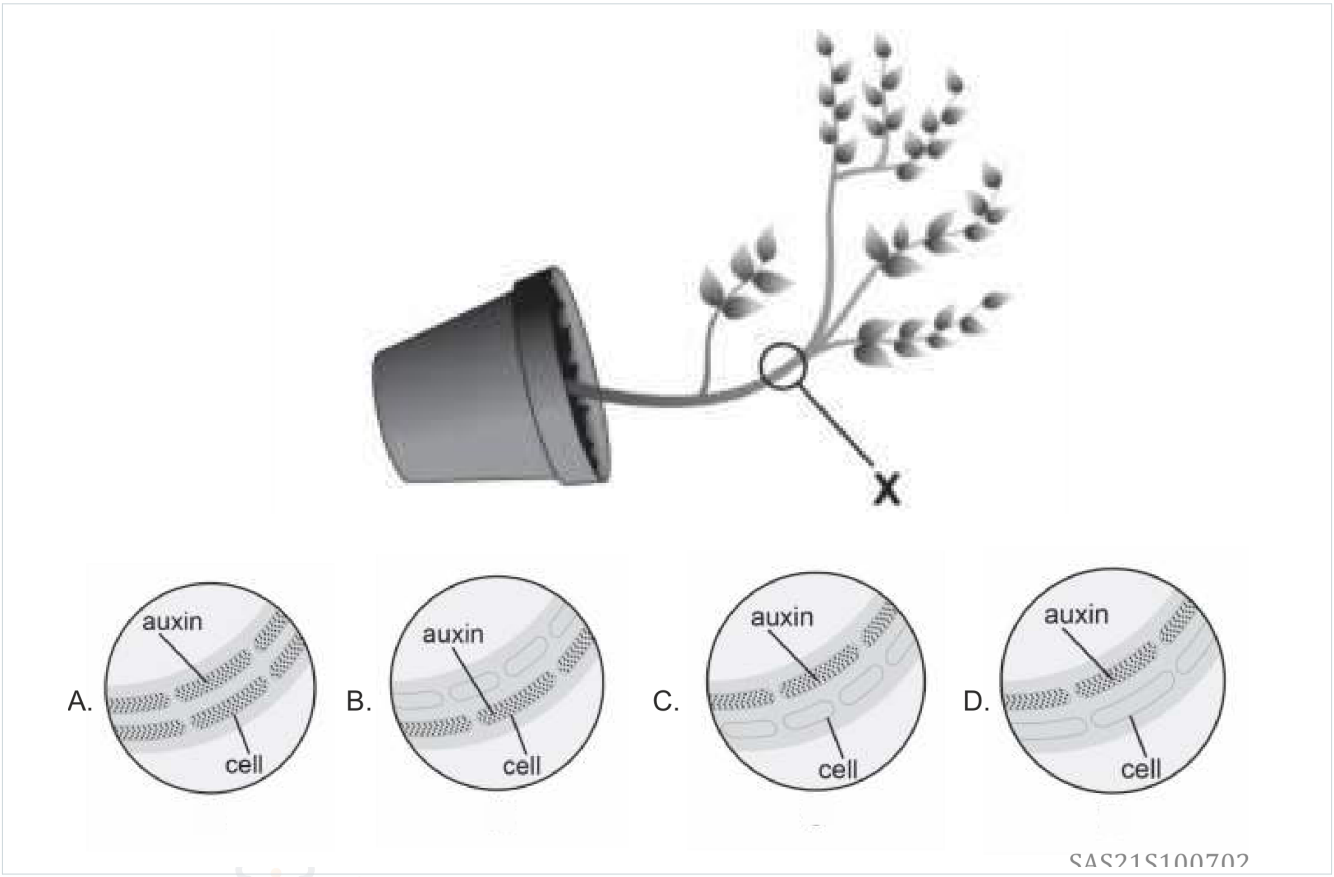


Figure from the question paper – CBSE Competency Item Bank 2021, items 1–2 (item 1 options A–D below)

Source
• CBSE Competency Item Bank 2021 (SAS) — Item 2 (SAS21S100702) [F5 p408, key p463]

Also asked as: Item 1 of the same set asks which picture shows the size of cells and the distribution of auxin at part X of the stem (answer: picture B – options are pictures).

✓ Answer
A. Against gravity. (Item 1: the auxin picture is option B – more auxin and longer cells on the lower side of part X.)

Short Answer

Q90 **Short Answer** · 3 marks · ★ **Board ×1** 2 papers

(a) Some plants like pea plants have tendrils which help them to climb up other plants. Explain how is it done. Name the plant hormone responsible for this movement.
OR
(b) Name the phenomenon occurring in plants which are under the control of gravity, water and chemicals with one example each that shows the movement involved.

Source
• CBSE 2023 · 31/6 (sets 1–3) — 31/6/2 Q29 [F9-OCR p21]
• Practice paper F6-6 — Q16 OR (ii) [F6 p371, key p378–379]

Also asked as: "Explain how tendrils help a pea plant climb up other plants or fences" (see Theme A limitations entry – CBSE 31/S); "Explain directional movement of a tendril in pea plant in response to touch. Name the hormone responsible" (Practice F6-6).

✔ **Answer**
(a) Tendrils are sensitive to touch [½]. When they come in contact with a support, the part of the tendril in contact with the object does not grow as rapidly as the part away from the object [1]; this makes the tendril circle around the object and cling to it [½]. Hormone – auxin [1].
(b) See answer above: geotropism (root downwards), hydrotropism (root towards water), chemotropism (pollen tube towards ovule).

⚠ **Note** NCERT does not name the hormone for tendrils; auxin (for unequal growth) is the accepted answer.

Q91 **Short Answer** · 3 marks · ★ **Board ×1** 1 paper

(a) Define geotropism and explain the term positive geotropism and negative geotropism giving one example for each.
OR
(b) Name the plant hormone that helps in the bending of the plant stem towards light. Explain its function. Also name this phenomenon.

Source
• CBSE VI · 31(B) · ZWYX (yr?) — Q29 [F9 p108]

✔ **Answer**
(a) The upward and downward growth of shoots and roots in response to the pull of earth or gravity is geotropism [1]. Positive geotropism – growth towards gravity, e.g. roots grow downwards [1]. Negative geotropism – growth away from gravity, e.g. shoots grow upwards [1].
OR
(b) Auxin [½]. It is synthesised at the shoot tip; when light comes from one side, auxin diffuses towards the shady side; its concentration stimulates the cells to grow longer on the side away from light, so the plant bends towards light [2]. Phenomenon – phototropism [½].

Q92 **Short Answer** · 3 marks · ★ 1 paper

Here is a picture of a germinating seed.
(a) What is the environmental stimulus required for the seed to develop roots downwards and shoots upwards? Name the respective phenomenon.
(b) What environmental factor in the experimental setup shown below can be altered in Figure X to observe the direction of root growth as observed in Figure Y?
(c) Name the tropic movement that occurs when pollen tubes grow towards ovules.

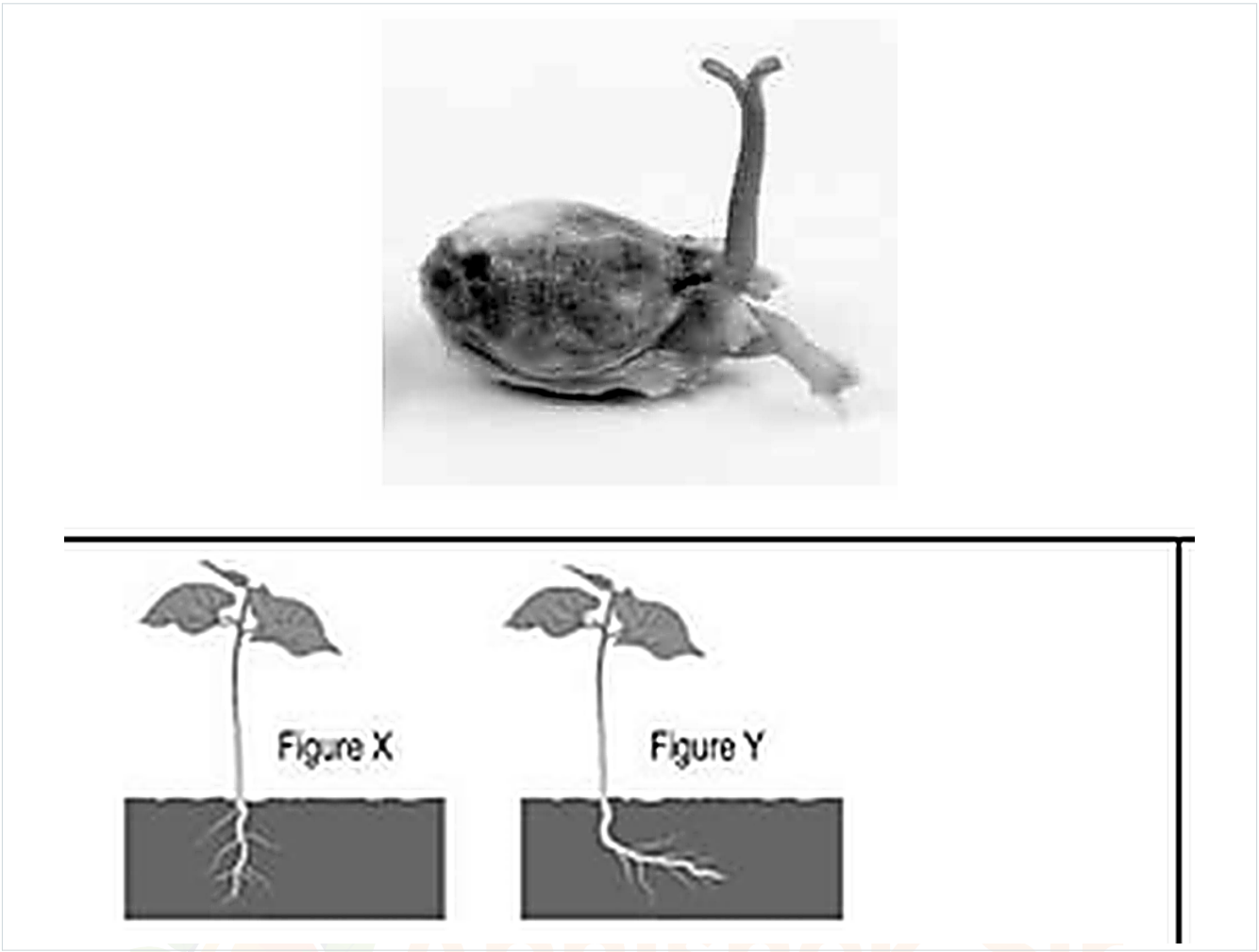


Figure from the question paper (teacher's screenshot, enhanced) – CBSE CFPQ Q.138 (seed; Figures X and Y)

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.138 [F6 p64–65, key p76]

✔ Answer
(a) Roots downwards – gravity – positive geotropism; shoot upwards – key says sunlight – positive phototropism (it is also negative geotropism) [1]. (b) Water – keep a source of water on one side of the root (hydrotropism) [1]. (c) Chemotropism [1].

Long Answer

Q93 **Long Answer** · 5 marks · ★ 1 paper

(a) What are tropic movements? Give an example of a plant hormone which (1) inhibits growth and (2) promotes cell division.
(b) Explain directional movement of a tendril in pea plant in response to touch. Name the hormone responsible for this movement.

Source
• Practice paper F6-6 — Q16 OR [F6 p371, key p378–379]

✔ Answer
(a) Directional growth movements of plant parts in response to a stimulus, towards or away from it [1].
(1) Abscisic acid [½] (2) Cytokinin [½].
(b) When the tendril touches a support, the part in contact grows slowly and the part away from it grows faster, so the tendril coils around the support [2]. Hormone – auxin [1].

Case / Source-based

Q94 Case / Source-based · 4 marks · ★ Board ×1 1 paper

Plants exhibit movements in response to various environmental stimuli to adopt and survive in their surroundings. These movements, influenced by external factors such as light, gravity, water and chemicals are regulated by specific plant hormones. For example, the differential growth of plant parts allows them to bend, grow or orient themselves in particular directions. Roots and shoots often show contrasting response to the same stimulus, highlighting the complex mechanisms involved in plant growth and development.
(a) Why is hydrotropism essential for plants?
(b) What role does auxin play in the growth of plants?
(c) Differentiate between movement shown by the sensitive plant and tropic movement by plants (Two points).
OR
How does movement of roots differ from that of shoots in response to gravity and light?

Source
• CBSE 2026 · 31/4 (sets 1–3) — 31/4/1 Q15; 31/4/2 Q15; 31/4/3 Q15 [F4 p374, p406, p438]

✓ Answer
(a) Roots grow towards water, so the plant gets water (and minerals dissolved in it) from the soil [1]. (b) Auxin helps cells to grow longer (cell elongation); it causes the shoot to bend towards light [1]. (c) Sensitive plant: no growth involved; quick; not directional. Tropic movement: growth involved; slow; directional – towards or away from the stimulus [2].
OR Roots grow downwards towards gravity (positive geotropism) and bend away from light (negative phototropism); shoots grow upwards away from gravity (negative geotropism) and bend towards light (positive phototropism) [2].

Q95 Case / Source-based · 4 marks · ★ Board ×1 1 paper

The growth movements of plant parts in which the direction of the stimulus determines the direction of the response is known as tropic movements or tropism. Plants also have non-directional movements which may not be growth dependent.
(I) Name the movement which causes 'X' and 'Y' to grow downwards and upwards respectively.
(II) Write the name of a hormone that plays a major role in (i) falling of leaves (ii) rapid cell division
(III) (a) Leaves of the sensitive plant move very quickly in response to 'touch'. How is this stimulus of touch communicated and explain how the movement takes place.
OR
(III) (b) Name the plant hormone which is synthesized at the shoot tip. How does this hormone helps the plant to bend towards light?



Figure from the question paper (teacher's screenshot, enhanced) – CBSE 2025, 31/6/3 Q38

Source
• CBSE 2025 · 31/6/3 · GF6HE — Q38 [F4 p29]

✔ Answer
(I) The pot is lying on its side. X (roots) grow downwards – positive geotropism; Y (shoot) grows upwards – negative geotropism (and bends towards light – phototropism) [1]. (II) (i) Abscisic acid (ii) Cytokinin [1]. (III)(a) Touch is communicated from cell to cell by electrical-chemical means (no specialised tissue); the cells change shape by changing the amount of water in them, resulting in swelling or shrinking, and the leaves fold [2].
OR (III)(b) Auxin [½]; when light comes from one side, auxin diffuses to the shady side, making cells there grow longer, so the shoot bends towards light [1½].

Q96 Case / Source-based · 4 marks · ★★ 3 papers

Read the text carefully and answer the questions: Fill a conical flask with water. Cover the neck of the flask with a wire mesh. Keep two or three freshly germinated bean seeds on the wire mesh. Take a cardboard box which is open from one side. Keep the flask in the box in such a manner that the open side of the box faces light coming from a window as shown in the given figure. After two or three days, you will notice that the shoots bend towards light and roots away from light. Now turn the flask so that the shoots are away from light and the roots towards the light. Leave it undisturbed in this condition for a few days. ... This upward and downward growth of shoots and roots, respectively, in response to the pull of earth or gravity, is obviously, geotropism.
(a) Name the kind of plant movement shown by this activity.
(b) After the flask is turned, do the older parts of the shoot and root change their direction? How is the new growth different?
(c) What conclusion can you draw from this activity?
OR Define geotropism.

▣ **Figure in the question paper:** NCERT Activity 6.1 set-up (flask, bean seeds, box). *(screenshot requested – see teacher's list)*

Source
• Practice sample paper, set 2 — Q38 [F5 p324–325, key p345]
• Practice sample paper, set 4 — Q38 [F5 p363, key p380–381]
• Practice paper F8-d — Q38 [F8 p55–56, key p65]

✔ Answer
(a) Tropic (growth-related directional) movement – phototropism of shoot and root [1]. (b) No, the old parts do not change direction; the new growth bends in a new direction – shoots again towards light and roots away from light [1]. (c) Shoots respond by bending towards light (positive phototropism) and roots bend away from light (negative phototropism) [2].
OR Growth of plant parts in response to gravity; roots grow downwards (positive) and shoots upwards (negative) [2].

⚠ **Note** KEY CORRECTED: the guide key says "Yes, old parts of the shoot and root change direction". NCERT Activity 6.1 asks this so students observe that old parts do NOT change direction; only new growth does.

Q97 Case / Source-based · 4 marks · ★ 1 paper

Some plants like the pea plant climb on other plants or fences by means of tendrils. These tendrils are sensitive to touch. When they come in contact with any support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object. This causes the tendril to circle around the object and thus cling to it.
i) Name the types of tropic movements shown by plants.
ii) The touch me not plant is an example of which type of tropism?
iii) Give one example of chemotropism.
iv) Name the plant hormone which promotes cell division in plant roots and shoot systems.

Source
• Bangalore Sahodaya Pre-board 1 2024-25 (Sets 1, 2) — Set 1 Q38 [F5 p10, key p32]

✔ Answer
i) Phototropism, geotropism, chemotropism, hydrotropism [1]. ii) It is not a tropism – the folding of leaves of touch-me-not is an immediate response to touch with no growth involved [1]. iii) Growth of pollen tubes towards ovules [1]. iv) Cytokinin [1].

⚠ **Note** KEY CORRECTED: school key says (ii) "thigmotropism". NCERT: movement of touch-me-not leaves is not a growth movement, so it is not a tropism. Also key (i) lists thigmotropism/thermotropism – beyond NCERT.

Q98 Case / Source-based · 4 marks · ★ 1 paper

Read the text carefully and answer the questions: Environmental triggers such as light, or gravity will change the directions that plant parts grow in. These directional, or tropic, movements can be either towards the stimulus or away from it. So, in two different kinds of phototropic movement, shoots respond by bending towards light while roots respond by bending away from it. ... One example of chemotropism is the growth of pollen tubes towards ovules.
(a) Where does negative phototropism occur in plants?
(b) Phototropism in shoots is attributed due to which plant hormone?
(c) Tendrils exhibit / twining of tendrils show which type of tropic movement?
OR If the stem grows towards sunlight and the root grows just opposite to it, then what type of movement of the stem is it?

Source
• Practice paper F8-h — Q38 [F8 p120–121, key p130]

✔ Answer
(a) In roots [1]. (b) Auxin [1]. (c) Growth movement in response to touch (key: thigmotropism – term not in NCERT) [2].
OR Positive phototropic movement [2].

Q99 Case / Source-based · 9 marks · ★ 1 paper

Fig. 1.1 shows how the root and shoot of a seed develop in response to stimuli.
(a) State the name of the plant hormone that causes the root and shoot to develop in the way shown. (1)
(b)(i) Identify the stimulus that causes the roots to grow in the direction shown. (1) (ii) State the name of this response. (1)
(c)(i) Identify the stimulus that causes the shoot to grow in the direction shown. (1) (ii) State the name of this response. (1)
(d) Explain how the plant hormone controls the growth response of the shoot. (4)

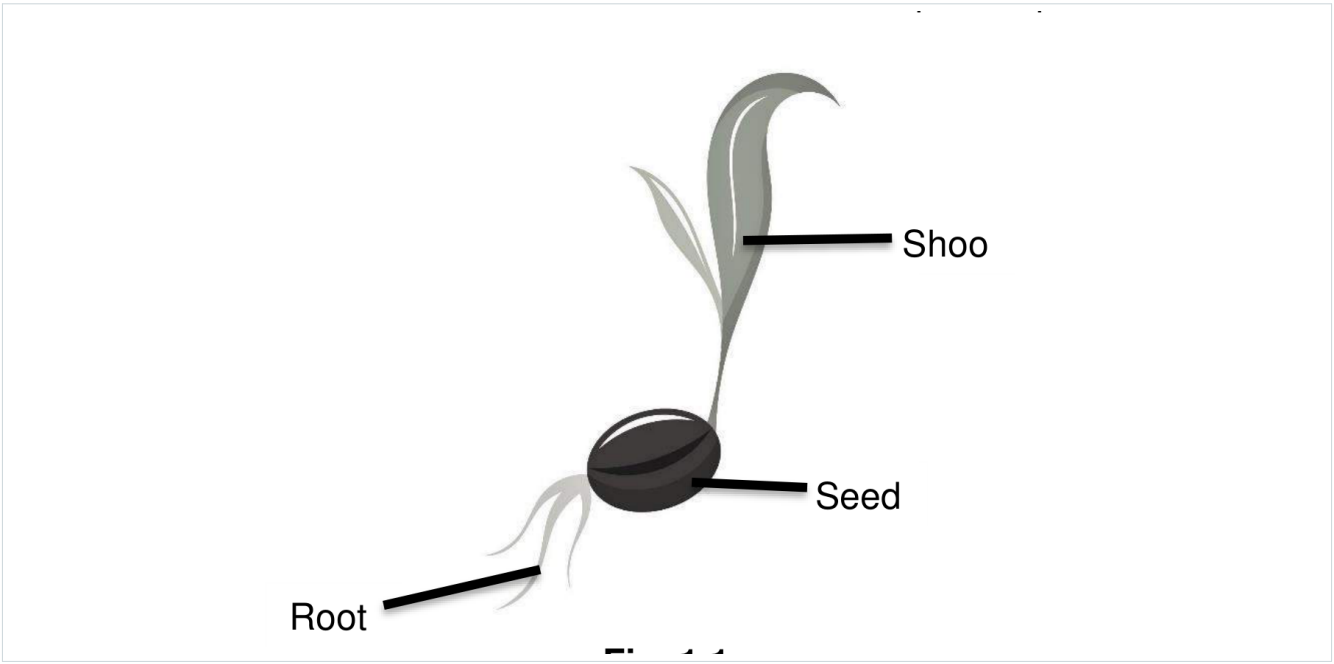


Figure from the question paper – CBSE–British Council Item Bank, Fig. 1.1

Source
• CBSE–British Council Item Bank 2021 — Science10DP4 [F5 p184–186]

✔ Answer
(a) Auxin. (b)(i) Gravity (ii) Geotropism (gravitropism). (c)(i) Light (ii) Phototropism. (d) Hormone is made at the shoot tip; it moves (diffuses); it collects on the side away from light (shaded side); it causes the cells there to grow longer, so the shoot bends towards light.

⚠ **Note** British Council item – 9 marks in the item bank; use parts as short questions.

Q100 Case / Source-based · 4 marks · ★ 1 paper

The stimulus of touch triggers different responses in different plants. A blue pea plant is kept in a well-lit area. The shoot tip curls around the support while growing.
(a) The curling of the shoot tip is in response to touch, not sunlight. Describe an experiment to prove this statement.
(b) Explain the steps by which the Venus flytrap plant traps insects.

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.107 [F6 p58–59, key p69]

✔ Answer
(a) Keep one blue pea plant with a stick in the dark and another with a stick in sunlight; keep two more plants without a stick – one in the dark and one in sunlight. The shoot tip curls only where there is a stick, whether in light or dark – so the curling is a response to touch [2]. (b) The leaves of the Venus flytrap have hairs sensitive to touch; when an insect sits on the leaf it stimulates the hairs and the leaf shuts and traps it [2].

⚠ **Note** Venus flytrap is beyond NCERT.

Coordination in Plants · Plant hormones

20 questions · 27 papers · 10 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)

AUXIN	GIBBERELLINS	CYTOKININS	ABSCISIC ACID
shoot tip; cells grow longer; bending to light	growth of the stem	promote cell division (fruits, seeds)	inhibits growth; wilting of leaves

Multiple Choice

Q101 Multiple Choice · 1 mark · ★★ Board ×3 — 4 papers

A plant growth inhibitor hormone which causes wilting of leaves is called :

(A) Auxin
(B) Cytokinin
(C) Abscisic acid
(D) Gibberellin

Source
- CBSE 2024 · 31/4/1 · D4CBA/4 — Q7 [F1 p383]
- CBSE VI · 31(B) · E7FDG (2026) — Q2 [F9 p69]
- CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/1 Q8; 31/S/3 (Q no. lost) [F4 p218, p328]
- KVS Lucknow First Pre-board 2024-25 — Q12 [FM p30]

Also asked as: "Application of Abscisic acid on plants promotes – (A) Development of fruits (B) Wilting of leaves (C) Elongation of stem (D) Formation of flowers" – Ans (B) (CBSE 31/S/1, 31/S/3); "The main function of abscisic acid in plants is to – inhibit growth" (KVS Lucknow First PB 2024-25 Q12).

✔ Answer
(C) Abscisic acid.

Q102 Multiple Choice · 1 mark · ★★ Board ×1 — 3 papers

Select from the following a plant hormone which promotes cell division.

(A) Gibberellins
(B) Auxins
(C) Abscisic Acid
(D) Cytokinins

Source
- CBSE 2024 · 31/3 (sets 1–3) · DAA1B — 31/3/1 Q8; 31/3/3 Q10 [F1 p265, p331]
- Practice paper F6-3 — Q7 [F6 p306, key p313]
- CBSE Competency Item Bank 2021 (SAS) — Item 3 (SAS21S100703) [F5 p409, key p463]

Also asked as: CBSE item bank wording: "Cell division in plants is promoted by ____."

✔ Answer
(D) Cytokinins.

Q103 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

Select a pair of plant hormones from the following :

(A) Cytokinin and Insulin
(B) Gibberellin and Adrenaline
(C) Abscisic acid and Adrenaline
(D) Auxin and Abscisic acid

Source
- CBSE VI Suppl. · 31(B)/S Set-5 (CDBA/S?) (yr?) — Q8 [F1 p7]
- KVS Lucknow Pre-board 1 2022-23 — Q12 OR [FM p16]

Also asked as: "Which of the following is a plant hormone? (a) Insulin (b) Oestrogen (c) Thyroxin (d) Cytokinin" – Ans (d) (KVS Lucknow PB-1 2022-23 Q12 OR).

✔ **Answer**
(D) Auxin and Abscisic acid.

Q104 **Multiple Choice** · 1 mark · ★ **Board ×1** 2 papers

In plants the role of cytokinin is :

(A) Promote cell division.
(B) Wilting of leaves.
(C) Promote the opening of stomatal pore.
(D) Help in the growth of stem.

Source
• CBSE 2023 · 31/4 (sets 1–3) · Z1XYW/4 — 31/4/1 Q11 [F1 p361]
• Practice paper F6-6 — Q4 [F6 p369, key p377]

✔ **Answer**
(a) Promote cell division.

Q105 **Multiple Choice** · 1 mark · ★ **Board ×1** 2 papers

The plant hormone whose concentration stimulates the cells to grow longer on the side of the shoot which is away from light is :

(A) Cytokinins
(B) Gibberellins
(C) Adrenaline
(D) Auxins

Source
• CBSE 2025 · 31/1 (sets 1–3) · 1GEFH — 31/1/1 Q9; 31/1/2 Q8; 31/1/3 Q11 [F9 p188, p231, p276]
• KVS Lucknow Pre-board I 2023-24 — Q14 [F5 p254; FM p42]

Also asked as: "A plant hormone which helps in bending of stem of plant towards light is: Auxin / Gibberellin / Cytokinin / Ethylene" – Ans Auxin (KVS Lucknow PB-I 2023-24 Q14).

✔ **Answer**
(D) Auxins.

Q106 **Multiple Choice** · 1 mark · ★ 2 papers

The substance that triggers the fall of mature leaves and fruits from plants is due to

(A) auxin
(B) gibberellin
(C) abscisic acid
(D) cytokinin

Source
• KVS Ahmedabad Pre-board 2025-26 (Sets A, B) — Set A Q4; Set B Q1 [F9 p505, p517]
• Sample Question Paper-II (book, 75 marks) (yr?) — Q6 [F5 p239]

✔ **Answer**
(C) abscisic acid.

Q107 **Multiple Choice** · 1 mark · ★ 2 papers

Which statement explains why the shoot of a plant bends when exposed to light from one side?

(A) Diffusion of auxin into cells that are in shade causes cell division of those cells.
(B) Diffusion of auxin out of the cells that are in shade causes cell division of those cells.
(C) Diffusion of auxin into cells that are in shade causes elongation of those cells.
(D) Diffusion of auxin out of the cells that are in shade causes elongation of those cells.

Source
• Bangalore Sahodaya Pre-board 2023-24 (Set 1 + Set 2 key) — Set 1 Q11 [F5 p527, key p518]
• CBSE–British Council Item Bank 2021 — Science10CKV2 [F5 p187]

✔ **Answer**
(c) Diffusion of auxin into cells that are in shade causes elongation of those cells.

Q108 **Multiple Choice** · 1 mark · ★ 1 paper

A plant 'X' is placed in a closed box and is left unwatered for 15 days. Identify the plant hormone that is MOST LIKELY to be released and the reason for it.

(A) Auxins are released in response to the absence of light.
(B) Cytokinins are released to enhance the growth of the shoot.
(C) Abscisic acid is released in response to the scarcity of water.
(D) Gibberellins are produced in response to the absence of water.

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.97 [F6 p56, key p68]

✔ **Answer**
C. Abscisic acid is released in response to the scarcity of water.

Q109 **Multiple Choice** · 1 mark · ★ 1 paper

Auxin is a plant hormone that promotes cell elongation and is produced by the apical meristem. It inhibits the growth of lateral buds which are present at nodes. As long as sufficient auxin is produced by the apical meristem, the lateral buds remain dormant. A gardener wants the plants in the hedge that he is growing to become bushier with more branches. Which of the following should he do?

(A) spray water on the tips of the stems to increase growth
(B) dig around the plant roots and apply more manure
(C) trim the hedge by cutting off the tips of the stems
(D) remove all the weeds that grow around the hedge

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q2 [F4 p735, key p738]

✔ **Answer**
(3) Trim the hedge by cutting off the tips of the stems.

Q110 **Multiple Choice** · 1 mark · ★ 1 paper

Shown in the figure below is a plant in which auxin is synthesised at part X of the plant. Geeta took the potted plant and cut off part X. She then took the plant and kept it near a window with sunlight and observed it after 7 days. Which of the following is she likely to have observed?

(A) Part Y grew and bent towards the window.
(B) Part Z started growing upwards and out of the soil.
(C) Part Y did not grow at all.
(D) Part Y grew upwards.

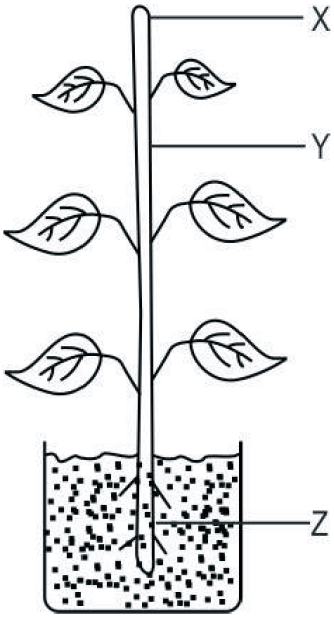


Figure from the question paper – CBSE CFPQ Q3

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q3 [F4 p735, key p738]

✔ Answer
(3) Part Y did not grow at all (CBSE key) – without the shoot tip there is no auxin, so the stem does not elongate or bend towards the window.

Assertion-Reason

Q111 Assertion-Reason · 1 mark · ★ — 1 paper

Assertion (A): Auxin is known as a growth hormone.
Reason (R): Concentration of Auxin is maximum at root and shoot tips. It also helps in phototropism and formation of tendrils.

Source
• KVS Delhi Pre-board II 2024-25 — Q18 [FM p89]

✔ Answer
(c) A is true but R is false. Auxin is synthesised at the shoot tip and helps cells grow longer, but it does not "form" tendrils (it helps tendrils coil by unequal growth).

⚠ **Note** Ambiguous item – no key in file. (C) chosen on NCERT facts.

Very Short Answer

Q112 Very Short Answer · 2 marks · ★★★ Board ×6 — 7 papers

(a) Where are auxins synthesised? How are they related to phototropism?
OR
(b) There is a hormone which regulates carbohydrates, proteins and fat metabolism in the human body. Name the hormone and the gland which secretes it. State the importance of iodised salt in our diet.

Source
- CBSE VI Suppl. · 31(B)/S · EFGH/S (yr?) — Q23 [F1 p42]
- CBSE 2024 · 31/3 (sets 1–3) · DAA1B — 31/3/1 Q22; 31/3/2 Q24; 31/3/3 Q23 [F1 p273, p307, p339]
- CBSE 2023 · 31/1 (sets 1–3) · Z1XYW — 31/1/3 Q21 [F1 p164]
- CBSE 2023 · 31/4 (sets 1–3) · Z1XYW/4 — 31/4/3 Q21 [F1 p440]
- CBSE VI · 31(B) · E7FDG (2026) — Q11 [F9 p73]
- CBSE VI · 11-31(B) Set-5 (yr?) — Q31(b) (3 marks) [F9 p141]
- Practice paper F6-3 — Q12 [F6 p306, key p314]

Also asked as: Asked in many words: "Where are auxins synthesized? How do they promote phototropism?" (CBSE 2024 31/3); "A plant hormone helps in bending of stem towards light. Name the hormone and explain how is the movement achieved" (CBSE 2023 31/1/3); "Name a plant hormone responsible for bending of a shoot ... exposed to unidirectional light. How does it promote phototropism?" (CBSE 2023 31/4/3); "Name the hormone which is responsible for the bending of plants towards light and also explain the process" (CBSE VI 2026); "Name a plant growth hormone synthesized at the shoot tip. Explain its effect on the growth of a plant in response to light" (Practice F6-3). Part (b) is also entered in Theme C.

✔ Answer

(a) Auxin is synthesised at the shoot tip [½]. When light comes from one side of the plant, auxin diffuses towards the shady side of the shoot [½]. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light [½]. Thus the plant appears to bend towards light [½].
OR
(b) Thyroxin; thyroid gland [1]. Iodine is necessary for the thyroid gland to make thyroxin; iodised salt gives iodine, so we do not suffer from goitre (swollen neck) [1].

Q113 Very Short Answer · 2 marks · ★★ Board ×1 — 3 papers

What are plant hormones? Name one plant hormone each responsible for (i) phototropism and (ii) promotion of cell division.

Source
- CBSE VI Suppl. · 31(B)/S Set-5 (CDBA/S?) (yr?) — Q24 [F1 p13]
- KVS Lucknow Pre-board 1 2022-23 — Q30 [FM p17–18]
- Sample Question Paper-II (book, 75 marks) (yr?) — Q20 [F5 p242, key p247]

Also asked as: "(a) What are plant hormones? (b) Name the plant hormones responsible for: (i) Growth of stem (ii) Promotion of cell division (iii) Inhibition of growth (iv) Elongation of cells" (KVS Lucknow PB-1 2022-23 Q30); "Name the plant hormones responsible for (a) elongation of cells (b) growth of stem (c) promotion of cell division (d) falling of senescent leaves" (Sample Paper II Q20) – Ans auxin, gibberellin, cytokinin, abscisic acid.

✔ Answer

Plant hormones are chemical compounds that help to coordinate growth, development and responses to the environment; they are synthesised at places away from where they act and diffuse to the area of action [1]. (i) Auxin [½] (ii) Cytokinin [½].

Q114 Very Short Answer · 2 marks · ★ — 1 paper

(a) As first line of defense, stress hormones are released in humans. As an equivalent, which hormone is most likely to be released as first line of defense in plants?
(b) There have been reports of plant hormones being found in animal bodies even when they are not synthesised by the animal. What can be the most common pathway of entry of such hormones in animals?

Source
- CBSE Competency Focused Practice Qs (Vol 1) — Q6 [F4 p737, key p739]

✔ Answer

(a) Abscisic acid (ABA) [1]. (b) Through food (eating plants) [1].

Q115 Very Short Answer · 2 marks · ★ — 1 paper

(a) Name ONE plant hormone that controls directional growth.
(b) Plant hormones are also referred to as growth regulators and can be controlled by a number of stimuli. Mention ONE point of difference between the functioning of animal growth hormones and plant growth regulators with respect to such control.

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q7 [F4 p737, key p739]

✔ Answer
(a) Auxin [1]. (b) Animal growth hormones do not promote growth in response to outside stimuli like light and gravity, while plant growth regulators do (directional growth) [1].

Q116 Very Short Answer · 1 mark · ★ 1 paper

'Plant growth regulators do not always promote growth.' Cite one example in support of the above statement and mention the action of the same.

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q11 [F4 p737, key p739]

✔ Answer
Abscisic acid – it inhibits growth; its effects include wilting of leaves [1].

Q117 Very Short Answer · 2 marks · ★ 1 paper

(i) State the function of the following plant hormones: a. Abscisic acid b. Cytokinin
(ii) Define chemotropism.

Source
• Practice paper F6-10 — Q12 [F6 p431–432, key p438]

✔ Answer
(i) a. Abscisic acid – inhibits growth; causes wilting of leaves. b. Cytokinin – promotes cell division (present in greater amounts where there is rapid cell division, e.g. fruits and seeds). (ii) Directional growth movement of a plant part in response to chemicals, e.g. pollen tubes grow towards ovules.

Short Answer

Q118 Short Answer · 3 marks · ★ 1 paper

(a) What is the role of auxin in a plant?
(b) What should be the direction of light for the shoot tip to bend toward a side as given in the image below?
(c) Describe the mechanism involved in the bending of a shoot tip due to stimulation by light.

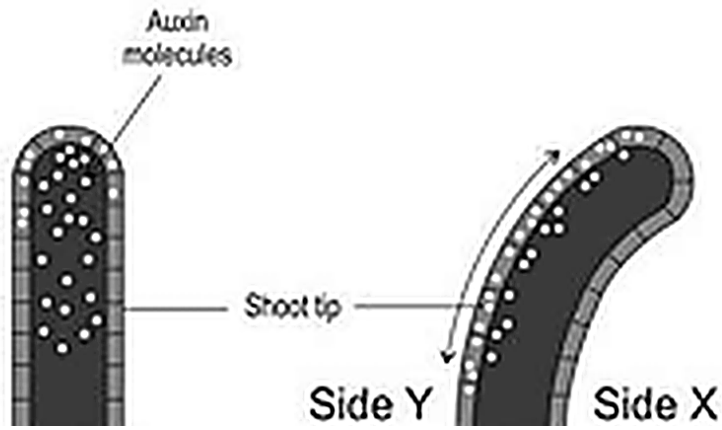


Figure from the question paper (teacher's screenshot, enhanced) – CBSE CFPQ Q.139

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.139 [F6 p65, key p76]

✔ Answer
(a) Auxin promotes cell growth and cell elongation [1]. (b) Light should come from the side towards which the tip bends (Side X in the figure) [1]. (c) When light comes from one side, auxin diffuses towards the side of the shoot away from light; this concentration of auxin makes the cells on that side grow longer, so the shoot tip bends towards light [1].

⚠ **Note** Figure checked: auxin is on the Side Y (shaded side), the tip bends towards Side X – so light comes from Side X. CBSE key is right.

Long Answer

Q119 **Long Answer** · 5 marks · ★ 2 papers

List the different plant hormones and state the role of each in the growth and development of plants.

Source
- Practice paper F8-b — Q35 OR [F8 p23]
- Practice sample paper, set 2 — Q35(b) [F5 p323]

Also asked as: "Name the hormone found where cells divide rapidly in a plant, and the hormone that stops growth." (practice set 2) – Ans cytokinin; abscisic acid.

✔ Answer
Auxin – synthesised at the shoot tip; helps cells to grow longer; causes bending towards light (phototropism) [1¼]. Gibberellins – help in the growth of the stem [1¼]. Cytokinins – promote cell division; present in greater amounts in areas of rapid cell division such as fruits and seeds [1¼]. Abscisic acid – inhibits growth; its effects include wilting of leaves [1¼].

Case / Source-based

Q120 **Case / Source-based** · 4 marks · ★ 1 paper

Read the following and answer the questions: Plants perform chemical coordination for various activities with the help of hormones. … There is a hormone that is synthesized in the tip of shoots. When light is coming from one side of the plant, this hormone diffuses towards the shady side of the shoot. Its concentration stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, the plant appears to bend towards light while growing.
(1) The name of the hormone being described is: (a) Auxin (b) Gibberellin (c) Cytokinin (d) Ethephon
(2) The movement of shoot towards light is known as (a) Chemotropism (b) Phototropism (c) Thigmotropism (d) Geotropism
(3) A young plant receives sunlight from one direction only. What will happen to its roots and shoots?
…

Source
- KVS Lucknow Set-1 paper (yr?) — Q38 [FM p51]

✔ Answer
(1) (a) Auxin. (2) (b) Phototropism. (3) The shoot bends towards light whereas the roots bend away from light.

⚠ **Note** Remaining sub-parts cut off at the page end – screenshot of FM p51–52 needed.

Hormones in Animals · Endocrine glands and their hormones

47 questions · 43 papers · 15 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)

Gland	Hormone	Job
Pituitary	Growth hormone	growth; lack → dwarfism
Thyroid	Thyroxin (needs iodine)	carbohydrate, protein, fat metabolism; lack of iodine → goitre
Adrenal	Adrenaline	emergency: heart beats faster, faster breathing
Pancreas	Insulin	blood sugar level; less insulin → diabetes
Testes / Ovary	Testosterone / Oestrogen	changes at puberty

Multiple Choice

Q121 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

Select the incorrect statement from the following :

(A) Iodine is necessary for production of thyroxin hormone by pituitary gland.
(B) Thyroxin regulates metabolism of carbohydrates, fats and protein.
(C) Swelling of neck may indicate goitre due to iodine deficiency.
(D) Thyroid is located in the neck region in our body.

Source
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/2 Q5 [F4 p127]
• KVS Raipur Pre-board II 2025-26 — Q12 (two copies) [F5 p299, p305]

Also asked as: "Which statement is not true about thyroxin? (a) Iron is essential for the synthesis of thyroxin (b) Thyroxin is also called thyroid hormone (c) Deficiency of iodine leads to less secretion of thyroxin (d) It regulates carbohydrates, protein and fat metabolism" – Ans (a) (KVS Raipur PB-II 2025-26 Q12).

✔ Answer
(A) – thyroxin is made by the thyroid gland, not the pituitary gland.

⚠ **Note** Checked with screenshot – option (A) reads "Iodine is necessary for production of thyroxin hormone by pituitary gland".

Q122 Multiple Choice · 1 mark · ★ Board ×1 — 2 papers

A doctor advised a person to take an injection of insulin because

(A) his heart was beating slowly.
(B) his blood pressure was low.
(C) he was looking short in height.
(D) his pancreas was not secreting the required hormone in proper amounts.

Source
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/1 Q9; 31/S/2 Q11 [F4 p191, p247]
• Bangalore Sahodaya Pre-board 1 2024-25 (Sets 1, 2) — Set 2 Q9 [F5 p14]

Also asked as: Bangalore version options: low BP / slow heart / goitre / "his sugar level in blood was high" – Ans (d).

✔ Answer
(D) his pancreas was not secreting the required hormone in proper amounts.

Q123 Multiple Choice · 1 mark · ★ Board ×1 — 1 paper

Identify the gland that enables the human beings to deal with an emergency situation.

(A) Pineal gland
(B) Pituitary gland
(C) Adrenal gland
(D) Pancreatic gland

Source
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/1 Q3 [F4 p93]

✔ Answer
(C) Adrenal gland.

Q124 Multiple Choice · 1 mark · ★ Board ×1 — 1 paper

Identify the gland in our body whose over-secretion will result in giant-sized children.

(A) Pituitary
(B) Thyroid
(C) Adrenal
(D) Pancreas

Source
• CBSE 2026 · 31/7 (sets 1–3) · E7FDG — 31/7/2 Q3 [F4 p50]

✔ Answer
(A) Pituitary (growth hormone).

Q125 Multiple Choice · 1 mark · ★ Board ×1 — 1 paper

Identify the endocrine gland that regulates the growth of human body.

(A) Pituitary gland
(B) Thyroid gland
(C) Pancreas
(D) Adrenal gland

Source
• CBSE 2026 · 31/5 (sets 1–3) — 31/5/1 (Q no. lost) [F4 p462]

✔ Answer
(A) Pituitary gland.

Q126 Multiple Choice · 1 mark · ★ Board ×1 — 1 paper

A gland which does not occur as a pair in the body of human beings is :

(A) Adrenal
(B) Ovary
(C) Pituitary
(D) Testis

Source
• CBSE VI Suppl. · 31(B)/S · EFGH/S (yr?) — Q10 [F1 p36]

✔ Answer
(C) Pituitary.

Q127 Multiple Choice · 1 mark · ★ Board ×1 — 1 paper

Select the gland that secretes digestive enzymes as well as hormones.

(A) Thyroid
(B) Pituitary
(C) Pancreas
(D) Adrenal

Source
• CBSE VI · 31(B) · LMNK2 (2026) — Q1 [F1 p57]

✔ Answer
(C) Pancreas.

Q128 **Multiple Choice** · 1 mark · ★ **Board ×1** 1 paper

Identify the hormone that regulates carbohydrate, protein and fat metabolism in the body.

(A) Growth hormone
(B) Adrenaline
(C) Thyroxin
(D) Testosterone

Source
• CBSE 2026 · 31/7 (sets 1–3) · E7FDG — 31/7/1 Q4; 31/7/3 Q6 (nos. inferred) [F4 p35, p66]

✔ Answer
(C) Thyroxin.

Q129 **Multiple Choice** · 1 mark · ★ **Board ×1** 1 paper

The organ that secretes insulin is :

(A) gall bladder
(B) small intestine
(C) pancreas
(D) stomach

Source
• CBSE VI · 31(B) · ZWYX (yr?) — Q8 [F9 p98]

✔ Answer
(c) pancreas.

Q130 **Multiple Choice** · 1 mark · ★★ 3 papers

Adrenaline hormone secreted by the adrenal glands in emergency situations. Which of the following is an effect of adrenaline on the body?

(A) Increase heartbeat rate and breathing rate
(B) Decrease heartbeat rate
(C) Reduces blood supply to muscles
(D) Slows down breathing rate

Source
• KVS Lucknow Pre-board 2025-26 (paper A) — Q2 [FM p71]
• CBSE–British Council Item Bank 2021 — Science10DP2 [F5 p199]
• Bangalore Sahodaya Pre-board 2023-24 (Set 1 + Set 2 key) — Set 2 Q11 (key only) [F5 p536]

Also asked as: British Council item: "Examples of responses to hormones: 1. growth of facial hair 2. increased blood pressure and pulse rate 3. widened pupils. Which responses are caused by adrenaline?" – Ans C (2 and 3 only). Bangalore 2023-24 Set 2 key Q11 "c) 2 and 3 only" is the same item.

✔ Answer
(a) Increase heartbeat rate and breathing rate.

Q131 **Multiple Choice** · 1 mark · ★★ 3 papers

The blood glucose level in a patient was very high. It may be due to inadequate secretion of:

(A) growth hormone from pituitary gland
(B) oestrogen from ovary
(C) insulin from pituitary gland
(D) insulin from pancreas

Source
• CBSE Sample Paper 2025-26 — Q4 [F5 p283; F6 p226; F8 key p319]
• CBSE Competency Focused Practice Qs (Vol 1) — Q1 [F4 p735, key p738]
• Bangalore Sahodaya Pre-board 2023-24 (Set 1 + Set 2 key) — Set 1 Q9 [F5 p526, key p518]

Also asked as: "Sapna / Baburam suffers from a condition due to which her/his average blood sugar level is 174 / 210 mg/dL (healthy <140). Which could be the cause?" – Ans insufficient production of insulin (CFPQ Q1; Bangalore 2023-24 Q9).

✔ Answer
D. insulin from pancreas.

Q132 **Multiple Choice** · 1 mark · ★★ 3 papers

Hormones are secreted by which type of glands?

(A) Exocrine glands
(B) Endocrine glands
(C) Salivary glands
(D) Sweat gland

Source
• PM SHRI KV Sitapur Periodic Test-2 2024-25 — Q6 [FM p1]
• CBSE–British Council Item Bank 2021 — Science10MS1 [F5 p177]
• Bangalore Sahodaya Pre-board 2023-24 (Set 1 + Set 2 key) — Set 2 Q9 (key only) [F5 p536]

Also asked as: British Council item: "Which row describes a hormone? mechanism/source: A chemical messenger–brain, B nerve signal–brain, C chemical messenger–gland, D nerve signal–gland" – Ans C (also Bangalore 2023-24 Set 2 key Q9 "It's a chemical messenger from a gland").

✔ Answer
(B) Endocrine glands.

Q133 **Multiple Choice** · 1 mark · ★ 2 papers

Match the following with correct response.
Column A: (i) The master gland (ii) Cytokinin (iii) Insulin (iv) Thyroxine
Column B: (a) Control cell division and cell growth (b) Regulates metabolism (c) Reduces blood sugar (d) Pituitary gland

Source
• Practice paper F6-6 — Q3 [F6 p369, key p377]
• Practice paper F6-10 — Q3 [F6 p430, key p437]

✔ Answer
(i)-(d), (ii)-(a), (iii)-(c), (iv)-(b).

Q134 **Multiple Choice** · 1 mark · ★ 1 paper

A health officer observes that many children in a hilly village show symptoms such as tiredness, slow growth, and swelling of the neck. Medical tests reveal low levels of thyroxine in their blood. The officer advises the community to modify their diet to solve the problem. Which of the following actions would best address the cause of their low thyroxine levels?

(A) Increasing calcium intake to strengthen bones
(B) Using iodized salt to compensate for iodine-poor soil and water
(C) Reducing iron-rich foods to prevent thyroid blockage
(D) Drinking more water to improve thyroid function

Source
• Bangalore Sahodaya Pre-board 1 2025-26 (Set 3) — Q6 [F5 p546]

✔ Answer
B. Using iodized salt to compensate for iodine-poor soil and water.

Q135 **Multiple Choice** · 1 mark · ★ 1 paper

When the level of sugar in the blood rises, which hormone is released to bring it back to normal?

(A) Insulin
(B) Adrenaline
(C) Growth hormone
(D) Thyroxine

Source
• Practice sample paper, set 1 — Q11 [F4 p567, key p579]

✔ **Answer**
(a) Insulin.

Q136 **Multiple Choice** · 1 mark · ★ 1 paper

Which of the following is a correct combination of an endocrine gland and its function?

(A) Sleep wake cycle regulation – pituitary gland
(B) Stress response fight or flight – testes
(C) Sugar metabolism – pancreas
(D) Growth regulation – adrenal gland

Source
• KVS Lucknow Pre-board 2025-26 (paper A) — Q3 [FM p71]

✔ **Answer**
(c) Sugar metabolism – pancreas.

Q137 **Multiple Choice** · 1 mark · ★ 1 paper

The secretion of which hormone leads to physical changes in the body when you are 10-12 years of age?

(A) Oestrogen from testes and testosterone from ovary.
(B) Oestrogen from adrenal gland and testosterone from pituitary gland.
(C) Testosterone from thyroid gland and oestrogen from pituitary gland.
(D) Testosterone from testes and oestrogen from ovary.

Source
• KVS Lucknow Pre-board 2025-26 (paper B) — Q4 [FM p79]

✔ **Answer**
D. Testosterone from testes and oestrogen from ovary.

Q138 **Multiple Choice** · 1 mark · ★ 1 paper

Match the following with correct response.
Column A: (i) Thyroid gland (ii) Pancreas (iii) Testis (iv) Ovaries
Column B: (a) Testosterone (b) Thyroxin (c) Estrogen (d) Insulin and glucagon

Source
• Practice paper F6-4 (two copies) — Q4 [F6 p322, p338; key p330]

✔ **Answer**
(i)-(b), (ii)-(d), (iii)-(a), (iv)-(c).

Q139 **Multiple Choice** · 1 mark · ★ 1 paper

Which of these health conditions is caused by a hormonal imbalance in the body?

(A) Scurvy
(B) Typhoid
(C) Diabetes
(D) Common cold

Source
• CBSE Competency Item Bank 2021 (SAS) — Item 10 (SAS21S100710) [F5 p410, key p465]

✔ **Answer**
C. Diabetes.

Q140 Multiple Choice · 1 mark · ★ 1 paper

Which of the following statements are correct? Circle 'Yes' or 'No'.
• Hormones are released directly into the bloodstream.
• Endocrine glands use electrical impulses.
• Sex hormones regulate changes associated with puberty.

Source
• CBSE Competency Item Bank 2021 (SAS) — Item 8 (SAS21S100708) [F5 p410, key p465]

✔ Answer
Yes; No; Yes.

Q141 Multiple Choice · 1 mark · ★ 1 paper

The graph shows the average height of boys and girls in a population. What does the graph indicate?

(A) The average height of boys is always greater than that of girls.
(B) The average height of girls is greater than that of boys in adulthood.
(C) The average height of girls during puberty is greater than that of boys.
(D) The average heights of girls and boys are the same between 4 and 20 years.

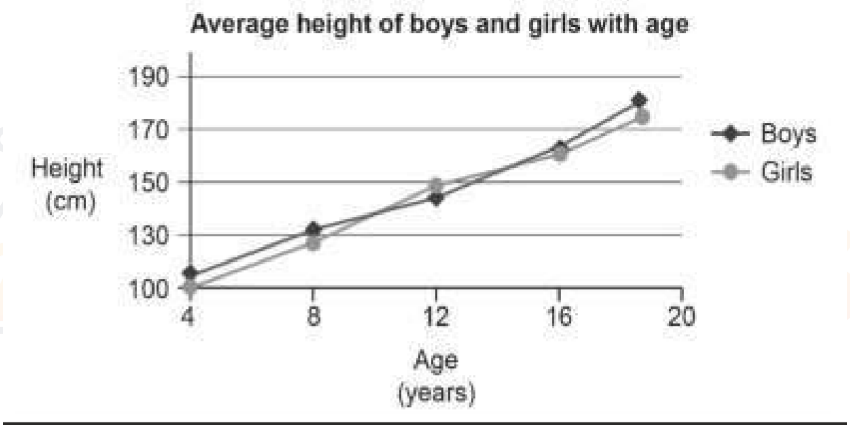


Figure from the question paper – CBSE Competency Item Bank 2021, item 6

Source
• CBSE Competency Item Bank 2021 (SAS) — Item 6 (SAS21S100706) [F5 p409–410, key p464]

Also asked as: Item 7: a student suggests the title "Height of boys and girls from birth to adulthood" – incorrect, because the graph shows heights only from age 4 onwards (no data at birth).

✔ Answer
C. The average height of girls during puberty is greater than that of boys.

Assertion–Reason

Q142 Assertion–Reason · 1 mark · ★ Board ×1 1 paper

Assertion (A): In case of iodine deficiency in our diet, there is a possibility that we might suffer from goitre.
Reason (R): One of the symptoms of goitre is swelling of neck.

Source
• CBSE 2026 · 31/5 (sets 1–3) — 31/5/3 Q9 [F4 p530]

✔ Answer
(B) Both A and R are true, but R is not the correct explanation of A.

Q143 **Assertion-Reason** · 1 mark · ★ 1 paper

Assertion (A): Iodine is necessary for the thyroid gland to make thyroxine hormone.
Reason (R): Thyroxine regulates carbohydrate, protein and fat metabolism in body.

Source
• PM SHRI KV Sitapur Periodic Test-2 2025-26 — Q9 [FM p69]

✔ Answer
(b) Both A and R are true but R is not the correct explanation of A.

Q144 **Assertion-Reason** · 1 mark · ★ 1 paper

Assertion (A): The pancreas secretes insulin.
Reason (R): Insulin helps in the breakdown of proteins in our body.

Source
• Sample Question Paper Set 7 — Q22 [F4 p671]

✔ Answer
(c) A is true but R is false. Insulin helps in regulating blood sugar levels.

Q145 **Assertion-Reason** · 1 mark · ★ 1 paper

Assertion : Insulin and glucagon have the antagonist effects on the blood glucose level.
Reason : Insulin lowers the blood glucose level and glucagon raises the blood glucose level.

Source
• KVS Lucknow Monthly Test (30 marks) (yr?) — Q6 [FM p63]

✔ Answer
(a) Both A and R are true and R is the correct explanation of A.

⚠ **Note** Glucagon is not in the NCERT text – practice only.

Very Short Answer

Q146 **Very Short Answer** · 2 marks · ★ **Board ×1** 1 paper

What are hormones? Name the hormone secreted by thyroid and state its function.

Source
• CBSE old pattern · 31/1/1 · LRH/1 (60 marks) (yr? (pre-2010)) — Q22 (two copies) [6_merged OCR, LRH/1 p13]

✔ Answer
Hormones are chemical messengers secreted by endocrine glands directly into the blood, which carry them to the target organs [1]. Thyroid secretes thyroxin [½]; it regulates carbohydrate, protein and fat metabolism in the body to provide the best balance for growth [½].

Q147 **Very Short Answer** · 2 marks · ★ **Board ×1** 1 paper

(a) Write the role of insulin in regulating blood sugar levels in human body. Mention the disease caused due to it.
(b) How is the timing and the amount of release of insulin in the blood regulated?

Source
• CBSE 2023 · 31/1 (sets 1–3) · Z1XYW — 31/1/1 Q22 [F1 p98]

✔ Answer
(a) Insulin is produced by the pancreas and helps in regulating blood sugar levels [½]. If it is not secreted in proper amounts, the sugar level in the blood rises causing many harmful effects – diabetes [½].
(b) By feedback mechanism: if the sugar level in blood rises, it is detected by the cells of the pancreas which respond by producing more insulin; as the blood sugar level falls, insulin secretion is reduced [1].

Q148 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

Name the hormone secreted in scary situations by animals. Write any three responses which enable the animal body to deal with it.

Source
• CBSE 2023 · 31/4 (sets 1–3) · Z1XYW/4 — 31/4/2 Q25 [F1 p418]

✔ Answer
Adrenaline [½]. (i) The heart beats faster, resulting in supply of more oxygen to our muscles; (ii) the blood to the digestive system and skin is reduced due to contraction of muscles around small arteries in these organs, diverting blood to skeletal muscles; (iii) the breathing rate increases because of the contractions of the diaphragm and the rib muscles [1½].

Q149 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(A) State the two important roles of male sex hormone – testosterone.
OR
(B) Give two reasons why secretions of prostate gland and seminal vesicles are of significance in human male reproductive system.

Source
• CBSE 2026 · 31/8 (sets 1–3) · 8DEFG — 31/8/3 Q12 [F4 p161]

Also asked as: Part (B) belongs to Ch 7.

✔ Answer
(A) Testosterone brings about the changes in appearance seen in boys at puberty (e.g. thick hair on face, voice cracking) [1]; it helps in the formation of sperms [1].
OR (B) Their secretions make the transport of sperms easier [1] and also provide nutrition to the sperms [1].

Q150 Very Short Answer · 2 marks · ★ — 2 papers

Why is the use of iodised salt advisable?

Source
• Practice paper F6-6 — Q12 [F6 p370, key p378]
• Practice paper F6-1 (two copies) — Q16 OR (a) [F6 p259, key p268]

Also asked as: "(a) Why is the use of iodised salt advisable? Name the disease caused due to deficiency of iodine in our diet and state its one symptom. (b) How do nerve impulses travel in the body?" (Practice F6-1 Q16 OR).

✔ Answer
Iodine is necessary for the thyroid gland to make thyroxin hormone [1]. Thyroxin regulates carbohydrate, protein and fat metabolism; in case iodine is deficient in our diet, there is a possibility that we might suffer from goitre (swollen neck) [1].

Q151 Very Short Answer · 1 mark · ★ — 2 papers

While on a roller coaster ride, Aditya noticed an increase in his heartbeat and his breathing. Which hormone is responsible for the changes in Aditya's body?

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q10 [F4 p737, key p739]
• CBSE Competency Focused Practice Qs (Vol 2) — Q.101 [F6 p57, key p68]

Also asked as: CFPQ Q.101: "(P) Adrenaline is also called the fight or flight hormone. (Q) Adrenaline affects the heart to increase heart rate for optimum delivery of oxygen to muscles. Does (Q) offer a valid explanation for (P)?" – Yes; adrenaline prepares the muscles for a fight or escape response.

✔ Answer
Adrenaline.

Q152 Very Short Answer · 2 marks · ★ 1 paper

Metamorphosis is a biological process by which an animal physically develops after birth or hatching... The diagram shows such metamorphosis in butterflies.
(a) What are the chemicals that control such developmental changes in the butterfly's body structure called?
(b) Name ONE developmental change (other than external changes in body structure) in a human female during puberty brought about by the action of the type of chemicals mentioned in (a).
(c) What is the most likely genetic difference between the larval and adult stages in the life cycle of the butterfly?

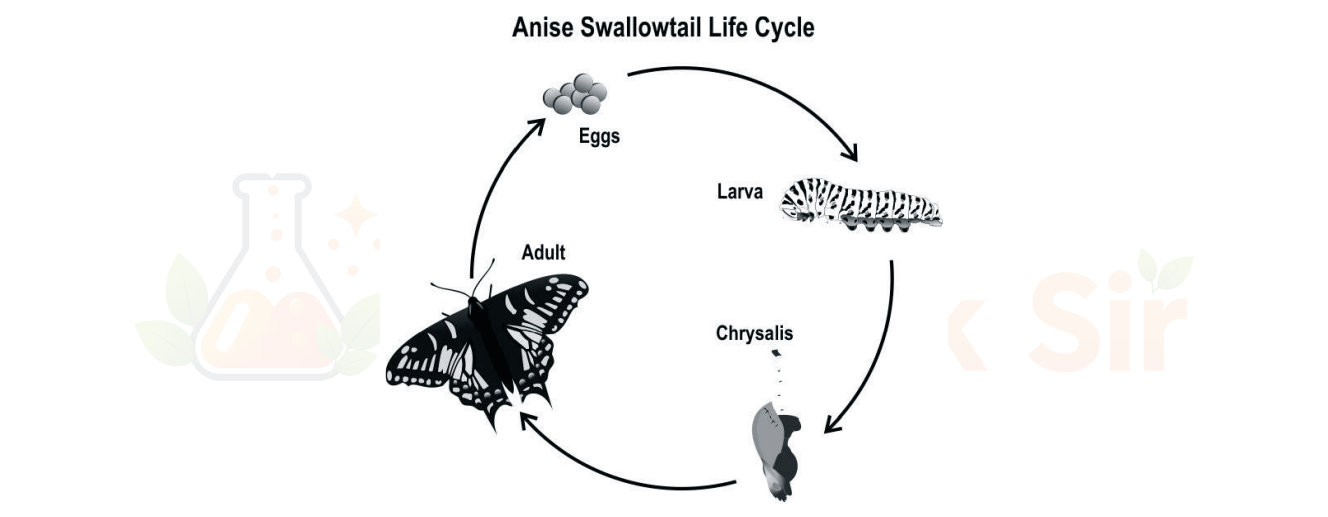


Figure from the question paper – CBSE CFPQ Q5

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q5 [F4 p736, key p739]

✔ Answer
(a) Hormones [½]. (b) Onset of menstrual cycle [½]. (c) There is no genetic difference between the larval and adult stages [1].

Q153 Very Short Answer · 2 marks · ★ 1 paper

What is gland, types of gland and explain hypothalamus?

Source
• PM SHRI KV Sitapur Periodic Test-2 2024-25 — Q17 [FM p2]

✔ Answer
A gland is an organ that makes and releases a substance (secretion) [½]. Exocrine glands pour secretions through ducts (e.g. salivary glands); endocrine glands pour hormones directly into blood (e.g. thyroid) [1]. Hypothalamus is a part of the fore-brain; it controls hunger (and regulates the pituitary) [½].

⚠ **Note** Loosely worded school-test item.

Short Answer

Q154 Short Answer · 3 marks · ★★ Board ×5 — 5 papers

Name the hormone released and the gland which secretes it in human beings during scary situations. How does the body respond to enable it to deal with the situation?

Source
- CBSE 2023 · 31/2 (sets 1–3) · Z1XYW — 31/2/1 Q30; 31/2/3 Q33 [F1 p194, p250]
- CBSE 2024 · 31/3 (sets 1–3) · DAA1B — 31/3/3 Q30 [F1 p343]
- CBSE 2025 · 31/1 (sets 1–3) · 1GEFH — 31/1/3 Q31 [F9 p284]
- CBSE VI · 11-31(B) Set-5 (yr?) — Q31(a) [F9 p141]
- CBSE 2026 · 31/5 (sets 1–3) — 31/5/2 Q14 (a, b) [F4 p500]

Also asked as: "Write the name and location of a hormone which helps a person to respond when chased by a dog. Mention the responses ..." (CBSE 2024 31/3/3); "A hormone 'X' is secreted in blood when a person is under scary situation. (a) Identify X and the gland (b) Explain its role" (CBSE 2025 31/1/3); "(a) Mention the gland and hormone secreted in scary situation (b) Write two responses ..." (CBSE 2026 31/5/2 Q14); VI 11-31(B) Q31(a) with OR (b) auxin – see Theme B. The 2023 31/6 version is entered with the reflex-arc OR question (Theme A).

✔ Answer

Adrenaline [½]; adrenal gland [½]. Adrenaline is secreted directly into the blood and carried to different parts of the body. Heart beats faster, supplying more oxygen to muscles [½]; blood to the digestive system and skin is reduced by contraction of muscles around small arteries, and diverted to skeletal muscles [½]; breathing rate increases because of contraction of diaphragm and rib muscles [½]; all these responses together prepare the body to deal with the situation [½].

Q155 Short Answer · 3 marks · ★ Board ×1 — 1 paper

(a) Give reasons for the following: (a) Adrenal gland is known as the stress gland of the body. (b) Prenatal sex determination is banned in India. (c) Vegetative propagation is advantageous in some plants.

Source
- CBSE 2026 · 31/4 (sets 1–3) — 31/4/1 Q13; 31/4/3 Q14 [F4 p372, p436]

Also asked as: Parts (b) and (c) belong to Ch 7 (How do Organisms Reproduce?).

✔ Answer

(a) In stress/emergency (scary) situations the adrenal gland secretes adrenaline, which prepares the body to deal with the situation – faster heart beat, faster breathing, more blood to skeletal muscles [1]. (b) Reckless female foeticide leads to a fall in the child sex ratio; to keep a healthy society, prenatal sex determination is banned by law [1]. (c) Plants can bear flowers and fruits earlier; plants that have lost the capacity to produce seeds (banana, orange, rose, jasmine) can be propagated; all plants are genetically similar to the parent [1].

Q156 Short Answer · 3 marks · ★ — 2 papers

Name the hormones secreted by the following endocrine glands and write one function of each hormone: Thyroid gland, Pancreas, Adrenal gland
OR
Illustrate with an example that plants show stimulus towards light.

Source
- KVS Lucknow Pre-board 1 2022-23 — Q33 [FM p18]
- KVS Lucknow Pre-board 2 2024-25 — Q30 [FM p24]

Also asked as: "(a) Name the glands that secrete (i) Adrenaline (ii) Thyroxin (b) Explain with example how the timing and amount of hormone released are regulated" (CBSE 2025 31/1/2 Q33) – see C2; "Name the hormone required for (A) lowering of blood glucose (B) development of moustache & beard in human males (C) metabolism of carbohydrate, fat and protein. Also name the gland" (KVS Lucknow PB-2 2024-25 Q30) – Ans insulin–pancreas; testosterone–testes; thyroxin–thyroid.

✔ **Answer**
Thyroid – thyroxin: regulates carbohydrate, protein and fat metabolism [1]. Pancreas – insulin: regulates blood sugar level [1]. Adrenal – adrenaline: prepares the body to deal with emergency (heart beats faster, more oxygen to muscles) [1].
OR Shoot bends towards light (phototropism) – NCERT Activity 6.1; auxin at the shoot tip diffuses to the shady side and makes cells there grow longer, so the shoot bends towards light [3].

Q157 Short Answer · 3 marks · ★ 2 papers

A doctor has advised Sameer to reduce sugar intake in his diet and do regular exercise after checking his blood test reports.
a) Which disease do you think Sameer is suffering from?
b) Name the hormone responsible for this disease and the organ producing the hormone.
c) List the function of the above hormone.

Source
• KVS Lucknow First Pre-board 2024-25 — Q31 [FM p32]
• Practice paper F8-f — Q38 [F8 p88, key p97]

Also asked as: "Refer to Table B showing blood glucose of patients X and Y – infer the disease; identify the hormone; high/low sugar diet?" (Practice F8-f Q38 – Ans diabetes; insulin; low sugar).

✔ **Answer**
a) Diabetes [1]. b) Insulin; pancreas [1]. c) Insulin helps in regulating blood sugar levels [1].

Q158 Short Answer · 3 marks · ★ 1 paper

Why do we call pituitary gland as the master gland? Where is it located and what are its functions?

Source
• Practice paper F8-f — Section E OR [F8 p87, key p95]

✔ **Answer**
It regulates many body functions and controls the working of other endocrine glands [1]. It lies in the brain (below the hypothalamus) [1]. It secretes growth hormone that regulates growth and development; deficiency in childhood leads to dwarfism [1].

⚠ **Note** "Master gland" is not in NCERT text; marks shown in paper for Section E.

Q159 Short Answer · 3 marks · ★ 1 paper

Two glands A and B which occur in pairs are present in endocrine system. The pair of gland A is found only in females whereas the pair of glands B occur only in males. The gland A make and secrete hormone C whereas gland B make and secrete hormone E. In addition to hormone gland A makes gamete F whereas gland B makes gamete G.
(a) What are glands A and B? (b) Name the hormones C and E. (c) Name the gamete F and G.

Source
• KVS Lucknow Pre-board 2025-26 (paper B) — Q14 [FM p80]

✔ **Answer**
(a) A – ovaries, B – testes [1]. (b) C – oestrogen, E – testosterone [1]. (c) F – egg (ovum), G – sperm [1].

Q160 Short Answer · 3 marks · ★ 1 paper

Hormones … Name the hormones required for following: i. Lowering blood sugar level. ii. Regulate the rate of oxidation of carbohydrate, protein and fat. iii. It stimulates growth and development of all tissues. iv. Increase heartbeat. (with: a. What are hormones? b. List any two characteristics of hormones.)

Source
• KVS Lucknow Monthly Test (30 marks) (yr?) — Q12 OR [FM p64–65]

✔ Answer
a. Chemical messengers secreted by endocrine glands directly into blood. b. Secreted in small amounts; carried by blood to target organs; timing and amount controlled by feedback (any two). c. i. Insulin ii. Thyroxin iii. Growth hormone iv. Adrenaline.

Long Answer

Q161 Long Answer · 5 marks · ★ 2 papers

Given below is a diagram of the human endocrine system. Using the given diagram, answer the following questions:
i. How pituitary gland regulates the growth of the body?
ii. Which hormone is responsible for the carbohydrate, protein, and fat metabolism in the body?
iii. Which pair of glands prepare the body to deal with emergency situations?
iv. Which gland secretes insulin and what does it do in the body?
v. What is the function of endocrine glands?

▣ **Figure in the question paper:** Diagram of human endocrine system (NCERT Fig. 6.7). *(screenshot requested – see teacher's list)*

Source
• Practice paper F8-c — Q35 OR [F8 p39, key p46]
• Practice paper F6-8 — Q16 OR [F6 p401, key p409]

✔ Answer
i. Pituitary secretes growth hormone that regulates growth and development of the body; deficiency in childhood leads to dwarfism [1]. ii. Thyroxin (from thyroid) [1]. iii. Adrenal glands (on top of the kidneys) [1]. iv. Pancreas; insulin regulates blood sugar level [1]. v. Endocrine glands secrete hormones directly into the blood, which carry them to target organs to control and coordinate body activities [1].

Q162 Long Answer · 5 marks · ★ 1 paper

A person suffering from diabetes has frequent urination and feels tired all the time.
(i) Name the hormone involved and the gland which secretes it.
(ii) What is the function of this hormone in the body?
(iii) What causes the deficiency of this hormone? Mention the disease caused.
(iv) Explain any two ways this disease can be managed.
(v) Which hormone has an antagonist effect of that of insulin?

Source
• PM SHRI KV Sitapur Periodic Test-2 2025-26 — Q18 [FM p69]

✔ Answer
(i) Insulin; pancreas [1]. (ii) Helps in regulating blood sugar levels [1]. (iii) The pancreas does not secrete insulin in proper amounts; blood sugar level rises – diabetes [1]. (iv) Take less sugar in the diet, regular exercise, insulin injections as advised by the doctor [1]. (v) Glucagon (beyond NCERT) [1].

Q163 Long Answer · 5 marks · ★ 1 paper

(a) Name the hormone secreted by (i) Pituitary, and (ii) Thyroid stating one main function of each. Name the disorder a person is likely to suffer from due to the deficiency of the above mentioned hormones.
(b) How is the timing and amount of hormone released regulated? Explain with an example.

Source
• Practice paper F6-4 (two copies) — Q16 OR [F6 p324, p340; key p332]

✔ Answer
(a) (i) Growth hormone – regulates growth and development of the body; deficiency in childhood → dwarfism [1½]. (ii) Thyroxin – regulates carbohydrate, protein and fat metabolism; deficiency (lack of iodine) → goitre [1½].
(b) Feedback mechanism [½]. E.g. if the sugar level in blood rises, it is detected by the cells of the pancreas which respond by producing more insulin; as the blood sugar level falls, insulin secretion is reduced [1½].

Case / Source-based

Q164 Case / Source-based · 4 marks · ★ Board ×1 — 2 papers

Read the following passage and answer the questions that follow : In many animals including humans, adrenaline hormone prepares for scary situation. The target organs on which it acts include the heart. The blood to the digestive system and skin is reduced, but the heart beats faster and breathing rate also increases. All these responses together enable the animal body to deal with such scary situation.
(a) Attempt either subpart (i) or (ii) : (i) Name the gland that secretes adrenaline hormone. How does it enable the animal body to deal with a scary situation? (2) OR (ii) Why is the blood to the digestive system and skin reduced? (2)
(b) Why is it important for us to have iodised salt in our diet? (1)
(c) Why does a doctor advise some persons to take less sugar in their diet? (1)

Source
- CBSE VI · 31(B) · LMNK2 (2026) — Q15 [F1 p65]
- Practice paper F8-g — Q38 [F8 p105, key p113–114]

Also asked as: Similar case (Practice F8-g Q38): adrenaline passage – "(a) How does chemical coordination take place in animals? (b) Which hormone is called an emergency hormone? (c) Where are the adrenal glands present? OR How does our body respond when adrenaline is secreted?" – Ans hormones; adrenaline; on top of the kidneys.

✔ Answer
(a)(i) Adrenal gland [½]. Heart beats faster giving more oxygen to muscles; breathing rate increases; blood is diverted to skeletal muscles [1½].
OR (ii) By contraction of muscles around small arteries in these organs; this diverts the blood to our skeletal muscles, which need more oxygen and food for the quick response [2].
(b) Iodine is necessary for the thyroid gland to make thyroxin; lack of iodine causes goitre [1].
(c) The person may be suffering from diabetes – the pancreas is not making enough insulin, so blood sugar level is high [1].

Q165 Case / Source-based · 4 marks · ★ Board ×1 — 1 paper

Hormones are chemical informational molecules that are required in minute amounts and are directly poured into the blood stream. The animal hormones are secreted in the desired amounts by the endocrine glands. Each hormone is responsible for carrying out specific actions in the body. The deficiency or excess of hormones has a harmful effect on our body. Hence, the timing and the amount of hormones secreted by glands are controlled by the feedback mechanism.
(a) Name the hormones secreted by ovary and testes. (1)
(b) Write the function of adrenaline. (1)
(c) Write the name and function of a hormone secreted by (i) Pituitary gland and (ii) Thyroid gland. (2)
OR (c) What is the meaning of feedback mechanism? (2)

Source
- CBSE VI · 31(B) · ZWYX (yr?) — Q38 [F9 p116]

✔ **Answer**
(a) Ovary – oestrogen; testes – testosterone [1]. (b) Prepares the body to deal with emergency/scary situations – heart beats faster, breathing rate increases, more blood to skeletal muscles [1]. (c) (i) Pituitary – growth hormone: regulates growth and development of the body [1]. (ii) Thyroid – thyroxin: regulates carbohydrate, protein and fat metabolism [1].
OR (c) The amount of hormone released is controlled by the level of the substance it regulates; e.g. if blood sugar rises, the pancreas detects it and makes more insulin; as sugar falls, insulin secretion is reduced [2].

Q166 Case / Source-based · 4 marks · ★ 2 papers

Case 1: A patient was admitted to a hospital with low heart rate, fatigue, and swelling in the neck region. The doctor suspected a hormonal imbalance and ordered a blood test. The results showed significantly low thyroxine levels.
(a) Identify the endocrine gland involved in this case.
(b) Explain the probable cause of low thyroxine levels in the patient.
(c) Suggest two dietary changes that may help improve the patient's condition.
(d) State the role of thyroxine in regulating metabolism.

Source
• KVS Lucknow Monthly Test (30 marks) (yr?) — Q13 [FM p65]
• CBSE Competency Focused Practice Qs (Vol 2) — Q.140 [F6 p65–66, key p76–77]

Also asked as: Similar case (CFPQ Q.140): Ram from a remote Himalayan village – tightness in throat, hoarse voice; thyroid profile shows low T3, T4 and high TSH – (a) deficiency disease? (goitre) (b) two reasons the doctor asked for a thyroid test (iodine-poor location; symptoms).

✔ **Answer**
(a) Thyroid gland [1]. (b) Lack of iodine in the diet – iodine is necessary for the thyroid gland to make thyroxin [1]. (c) Use iodised salt; eat foods that give iodine [1]. (d) Thyroxin regulates carbohydrate, protein and fat metabolism in the body to provide the best balance for growth [1].

Q167 Case / Source-based · 4 marks · ★ 1 paper

Read the text carefully and answer the questions: You must have noticed many dramatic changes in your appearance as well as that of your friends as you approached 10-12 years of age. These changes associated with puberty are because of the secretion of testosterone in males and oestrogen in females. Do you know anyone in your family or friends who has been advised by the doctor to take less sugar in their diet because they are suffering from diabetes? As a treatment, they might be taking injections of insulin. This is a hormone that is produced by the pancreas.
(a) Why is the pancreas called a dual gland?
(b) Which hormones bring about the changes of puberty in boys and in girls?
(c) What will happen if the pancreas does not release enough insulin?
OR Name the cells of the pancreatic islets that release insulin and glucagon.

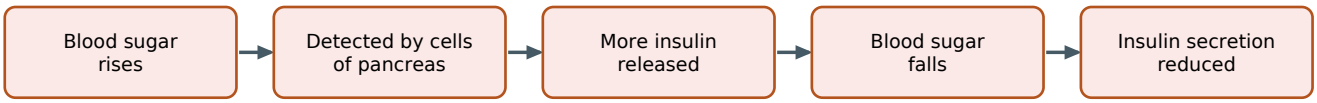
Source
• Practice paper "A" (sets 3 and 5; same paper in F6, F8) — Q38 [F4 p609–610, p647; F6 p496; F8 p7]

✔ **Answer**
(a) Pancreas makes pancreatic juice with enzymes (trypsin, lipase) that is sent to the small intestine, and also makes the hormone insulin that goes directly into blood [1]. (b) Testosterone in males and oestrogen in females [1]. (c) The sugar level in the blood rises, causing many harmful effects – diabetes [2].
OR Key: glucagon from alpha cells and insulin from beta cells of the islets (beyond NCERT).

Hormones in Animals · Timing and amount of hormones – feedback mechanism

7 questions · 9 papers · 4 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)



Very Short Answer

Q168 Very Short Answer · 2 marks · ★ Board ×1 — 1 paper

(a) "The timing and the amount of hormone secreted by a gland are regulated in the human body." Justify this statement with the help of an example.
OR
(b) Electrical impulse is an excellent means to transmit information in the animal body, but there are some limitations to the use of electrical impulses. State any two limitations.

Source
• CBSE 2026 · 31/2 (sets 1–3) · LMNK2 — 31/2/1 Q10; 31/2/2 Q10; 31/2/3 Q10 [F9 p315, p385, p455]

✓ Answer
(a) The timing and amount of hormone released are regulated by feedback mechanisms [½]. Example: if the sugar level in blood rises, it is detected by the cells of the pancreas which respond by producing more insulin [1]; as the blood sugar level falls, insulin secretion is reduced [½].
OR (b) See Theme A (limitations of electrical impulses).

Q169 Very Short Answer · 2 marks · ★ — 1 paper

In human beings, hormonal action is largely controlled by a mechanism where the secretion of one hormone is regulated by the action of another. An example of blood glucose levels control is shown in the diagram below.
(a) What is the mechanism of hormone action known as?
(b) Which is the sensor X that helps in detecting blood glucose level?
(c) What would happen if such mechanism is absent in humans?

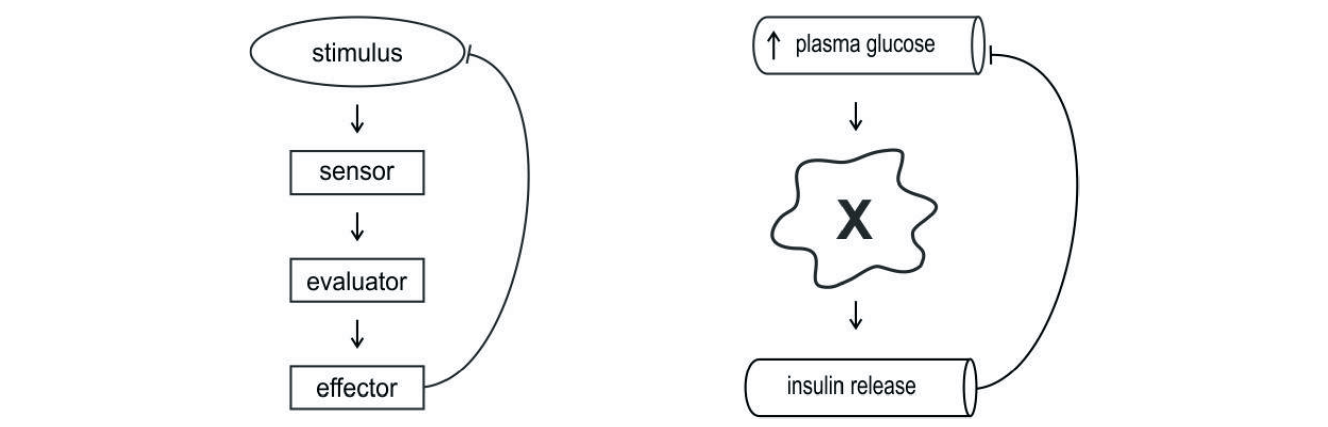


Figure from the question paper – CBSE CFPQ Q11

Source
• CBSE Competency Focused Practice Qs (Vol 1) — Q11 (Life Processes set) [F4 p723, key p730]

✓ Answer
(a) Feedback mechanism [½]. (b) Cells of the pancreas (key: beta cells) [½]. (c) The amount of hormone would not be controlled; e.g. blood sugar would rise or fall too much, causing harmful effects [1].

Short Answer

Q170 Short Answer · 3 marks · ★ Board ×1 — 1 paper

(a) Define hormone.
(b) "Hormones should be secreted in precise quantities. We have a feedback mechanism through which this is done." With the help of an example justify the statement.

Source
• CBSE 2025 · 31/2 (sets 1–3) · GHF2E — 31/2/1 Q29; 31/2/3 Q29 [F9 p354, p494]

✓ Answer
(a) Hormones are chemical messengers secreted by endocrine glands directly into the blood, and carried to the target organs where they act [1].
(b) The timing and amount of hormone released are regulated by feedback mechanisms [½]. For example, if the sugar level in blood rises, it is detected by the cells of the pancreas which respond by producing more insulin [1]. As the blood sugar level falls, insulin secretion is reduced [½].

Q171 Short Answer · 3 marks · ★ Board ×1 — 1 paper

(a) Name the glands that secrete : (i) Adrenaline (ii) Thyroxin
(b) Explain with example how the timing and amount of hormone released are regulated in the human body.

Source
• CBSE 2025 · 31/1 (sets 1–3) · 1GEFH — 31/1/2 Q33 [F9 p241]

✓ Answer
(a) (i) Adrenal gland (ii) Thyroid gland [½ + ½]. (b) By feedback mechanism: if the sugar level in blood rises, it is detected by the cells of the pancreas which respond by producing more insulin; as the blood sugar level falls, insulin secretion is reduced [2].

Q172 Short Answer · 3 marks · ★ — 2 papers

Explain how the release of hormones is controlled by the body with the help of a diagram. Name the mechanism.

Source
• Bangalore Sahodaya Pre-board 1 2024-25 (Sets 1, 2) — Set 2 Q29 [F5 p18]
• Bangalore Sahodaya Pre-board 2023-24 (Set 1 + Set 2 key) — Set 2 Q29 (key only) [F5 p538]

Also asked as: (Bangalore 2023-24 Set 2 Q29, key only): glucose-tolerance graph of a healthy person and a diabetic – trends; regulated by feedback mechanism.

✓ Answer
Feedback mechanism [1]. Flow diagram: blood sugar rises → detected by cells of pancreas → more insulin released → blood sugar falls → insulin secretion reduced [2].

Q173 Short Answer · 3 marks · ★ — 1 paper

Hormones in Animals are secreted in specific quantities by glands in the body. The secretion of these hormones is also regulated by the body. (a) The table below gives the normal reading of blood glucose levels before and after eating (80–100 before; 170–200 after). Ram's blood glucose level is 275. Name the hormone that would be released to regulate the blood glucose level. (b) Explain the regulation of the hormone named in answer (a) in TWO points.

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.106 [F6 p58, key p69]

✔ **Answer**
(a) Insulin [1]. (b) When the level of glucose increases, the cells of the pancreas release more insulin [1]; when the glucose level comes back to normal, the pancreas reduces insulin production – feedback mechanism [1].

Long Answer

Q174 **Long Answer** · 5 marks · ★ **Board ×1** 2 papers

(i) Name the disorder which a person is likely to suffer from due to the following : (I) Over-secretion of growth hormone (II) Deficiency of oestrogen in females (III) Less secretion of thyroxine. Also name the gland that secretes each of the hormones mentioned above.
(ii) How is the timing and amount of hormone released regulated? Explain with the help of an example.

Source
• CBSE 2023 · 31/2 (sets 1–3) · Z1XYW — 31/2/1 Q35(b); 31/2/2 Q35(b); 31/2/3 Q34(b) [F1 p198, p225, p252]
• Practice paper F6-2 — Q16 OR [F6 p275, key p283]

Also asked as: This is the OR part (b) of the 2023 31/2 5-mark question; part (a) is entered in C3.

✔ **Answer**
(i) (I) Gigantism – pituitary gland [1]. (II) Changes of puberty in girls do not take place properly (menstrual cycle may not start) – ovaries [1]. (III) Goitre – thyroid gland [1].
(ii) Feedback mechanism [½]. If the sugar level in blood rises, it is detected by the cells of the pancreas, which respond by producing more insulin; as the blood sugar level falls, insulin secretion is reduced [1½].

⚠ **Note** NCERT does not name the disorders for (I) and (II). Gigantism is accepted for (I). For (II) answer in NCERT terms (changes at puberty in girls not seen); the practice-paper key "female hypogonadism" is beyond NCERT. NCERT Q (in-text) on less thyroxine → goitre (from iodine lack); "hypothyroidism" in some keys.

Hormones in Animals · Nervous and hormonal coordination compared

8 questions · 9 papers · 2 board papers · Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

Picture it (re-drawn for study, not from a paper)

Nervous	Hormonal
Electrical impulses along nerves	Chemicals (hormones) carried by blood
Reaches only cells joined by nerves	Reaches all cells / target organs
Fast, short-lived	Slow, longer lasting

Assertion–Reason

Q175 **Assertion–Reason** · 1 mark · ★ **Board ×1** 1 paper

Assertion (A): Chemical co-ordination is seen in both plants and animals.
Reason (R): Plant hormones control directional growth, whereas in animals, growth is never seen in one direction only.

Source
• CBSE Supplementary · 31/S (sets 1–3) (yr?) — 31/S/1 Q18; 31/S/2 Q17; 31/S/3 Q20 [F4 p195, p251, p307]

✔ **Answer**
(B) Both A and R are true, but R is not the correct explanation of A.

⚠ **Note** No key in file. Both statements match NCERT (animals do not grow in the direction of a stimulus); R does not explain why both have chemical coordination.

Q176 **Assertion–Reason** · 1 mark · ★ 1 paper

Assertion (A): Our body maintains blood sugar levels.
Reason (R): Pancreas secretes insulin which helps to regulate blood sugar levels in the body.

Source
• Practice paper F6-2 — Q9 [F6 p274, key p282]

✔ Answer
(a) Both A and R are true and R is the correct explanation of A.

Q177 **Assertion-Reason** · 1 mark · ★ 1 paper

Assertion (A): The brain allows us to think and take actions based on that thinking.
Reason (R): The hind brain is the main thinking part of the brain which has regions which receive sensory impulses from various receptors.

Source
• Practice paper F6-7 — Q9 [F6 p384]

✔ Answer
(c) A is true but R is false. The fore-brain is the main thinking part.

Very Short Answer

Q178 **Very Short Answer** · 2 marks · ★ 1 paper

Neuronal coordination of the body is generally much faster than chemical coordination of the body. Mark the above statement as true or false and justify your answer.

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.137 [F6 p64, key p76]

✔ Answer
True [½]. Nervous coordination uses electrical impulses along nerves directly to the cells concerned; hormones are carried slowly by blood (diffusion) to all parts [1½].

Q179 **Very Short Answer** · 2 marks · ★ 1 paper

Human systems work in coordination with each other. Pratik spent an hour in the swimming pool and found himself breathing heavily.
(a) Name the: (i) system/s that help his body regain normalcy (ii) system/s that help the systems mentioned in (a-i) to function
(b) What can happen to the composition of Pratik's blood if the system/s mentioned in (a-i) does/do not respond properly?

Source
• CBSE Competency Focused Practice Qs (Vol 2) — Q.102 [F6 p57, key p68]

✔ Answer
(a) (i) Circulatory and respiratory systems (ii) Nervous system [1]. (b) The amount of carbon dioxide in blood would increase [1].

Long Answer

Q180 **Long Answer** · 5 marks · ★★ **Board ×1** 3 papers

(i) List three points of difference between nervous and hormonal mechanisms for control and coordination in animals.
(ii) How are auxins related with the bending of plant shoot towards unidirectional light? Explain.

Source
• CBSE 2023 · 31/2 (sets 1–3) · Z1XYW — 31/2/1 Q35(a); 31/2/2 Q35(a); 31/2/3 Q34(a) [F1 p198, p225, p250]
• Practice paper "A" (sets 3 and 5; same paper in F6, F8) — Q35 OR [F4 p607–608, p644; F6 p495; F8 p6]
• Practice sample paper, set 4 — Q35 OR [F5 p361]

✔ Answer
(i) Nervous – information passed as electrical impulses; hormonal – as chemicals (hormones) through blood [1]. Nervous – reaches only cells connected by nerves; hormonal – reaches all cells (target organs anywhere) [1]. Nervous – fast, short-lived; hormonal – slow, longer lasting [1].
(ii) Auxin is synthesised at the shoot tip; when light comes from one side, auxin diffuses towards the shady side; its concentration stimulates cells to grow longer on the side away from light; the shoot bends towards light [2].

⚠ **Note** Practice-paper key says hormonal mechanism "transmits information through blood cells" – wrong wording; hormones travel in blood (plasma), not in blood cells.

Q181 Long Answer · 5 marks · ★ 1 paper

'Nervous and hormonal systems together perform the function of control and coordination in human beings.' Justify the statement.

Source
• Practice paper F8-e — Q35 OR [F8 p71, key p79]

✔ Answer
Nervous system: receptors pick up stimuli → sensory nerves carry impulses to the brain/spinal cord → motor nerves carry the response to effectors (muscles/glands); gives quick responses and reflexes [2½]. Hormonal (endocrine) system: glands secrete hormones into blood which act on target organs – e.g. adrenaline in emergency, insulin for blood sugar, thyroxin for metabolism, growth hormone for growth; the two systems work together (e.g. in a scary situation nerves act at once and adrenaline supports the response) [2½].

Q182 Long Answer · 5 marks · ★ 1 paper

i. Distinguish between hormonal co-ordination in plants and animals.
ii. Which part of the brain is responsible for – 1. thinking 2. maintaining posture 3. salivation 4. controlling hunger
iii. How is brain and spinal-cord protected against mechanical injuries?

Source
• Practice paper F6-5 — Q16 OR [F6 p356–357, key p364]

✔ Answer
i. Plants: no specialised glands; hormones made at places away from where they act and diffuse; control growth and directional movements. Animals: hormones released by endocrine glands into blood; do not cause directional growth [2]. ii. 1. Cerebrum (fore-brain) 2. Cerebellum 3. Medulla 4. Hypothalamus (fore-brain) [2]. iii. Brain – bony box (skull) with fluid-filled balloon; spinal cord – vertebral column [1].

Summary – questions by sub-theme and type

Sub-theme	MCQ	A-R	VSA	SA	LA	Case	Total	Board papers
Receptors, neuron and nerve impulse	12	3	4	1	0	1	21	7
Reflex action and reflex arc	3	2	6	4	1	3	19	8
Human brain – parts and functions	11	0	7	1	2	3	24	11
Protecting the brain and spinal cord; CNS, PNS; limits of electrical impulses	3	0	3	1	0	1	8	8
Immediate response to stimulus (touch-me-not)	1	0	2	1	0	2	6	3
Movement due to growth – tropisms and tendrils	11	0	0	3	1	7	22	8
Plant hormones	10	1	6	1	1	1	20	10
Endocrine glands and their hormones	21	4	8	7	3	4	47	15
Timing and amount of hormones – feedback mechanism	0	0	2	4	1	0	7	4
Nervous and hormonal coordination compared	0	3	2	0	3	0	8	2
Total	**72**	**13**	**40**	**23**	**12**	**22**	**182**	**23**

Top 10 – revise these the night before

#	Q	Question	Board	Papers
1	Q112	(a) Where are auxins synthesised? How are they related to phototropism? OR (b) There is a hormone which regulates carbohydrates, ...	6	7
2	Q154	Name the hormone released and the gland which secretes it in human beings during scary situations. How does the body respond to ...	5	5
3	Q68	(a) Electrical impulses are an excellent means to respond to stimuli in animal bodies. List any two limitations to the use of ...	4	4
4	Q101	A plant growth inhibitor hormone which causes wilting of leaves is called :	3	4
5	Q71	(a) List two constituents of Central Nervous System (CNS). How are these components protected? (b) Write two limitations of the ...	2	5
6	Q52	(A) Name the part of brain which is responsible for the following actions : (i) Maintaining posture and balance (ii) Beating of ...	2	2
7	Q79	Identify the type of tropic movement that is responsible for the movement of the pollen tube towards an ovule from the following ...	1	5
8	Q1	In a nerve cell (neuron), the conversion of electrical signal to chemical signal occurs in/at :	1	4
9	Q41	A man underwent MRI of brain which shows some defects in the cerebellum of his brain. Which activity of that person will be ...	1	4
10	Q102	Select from the following a plant hormone which promotes cell division.	1	3

CBSE Class X Science (086) · 2026-27 syllabus

Chapter 7 — How do Organisms Reproduce?

Part A · Asexual reproduction and reproduction in flowering plants

NCERT 7.1 – 7.3.2 · previous-year questions with answers · built from the PYQ HUNT paper collection
Part B (7.3.3 Reproduction in Human Beings) follows from page 162.

Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

9	87	137	83
PYQ HUNT files searched page by page	papers had Part A questions — included	question appearances found	unique questions after clubbing (1 NEW)

What I went through

Kind of paper	Papers with Part A questions
CBSE board papers (main, supplementary, VI, old)	55
CBSE sample paper, CFPQ and competency items	3
KVS / KV / Sahodaya pre-boards and tests	11
Other practice papers	18
Total	**87**

Files searched: all nine PYQ HUNT files (F1, F4, F5, F6, F8, F9, FM and the OCR copies of the scanned old papers). Sets of one board exam are counted once in "Board ×n". Questions already in Chapter 8 (variation from sexual reproduction, halving of chromosomes) are not repeated here.

In this chapter

Concept map and theme map	p. 125	Must-do 20	p. 126
Do organisms create exact copies? (DNA copying…	p. 127	Fission – Amoeba, Leishmania and Plasmodium	p. 128
Fragmentation and regeneration	p. 132	Budding – Hydra and yeast	p. 136
Vegetative propagation	p. 139	Spore formation – Rhizopus (bread mould)	p. 145
Why the sexual mode of reproduction?	p. 148	Sexual reproduction in flowering plants	p. 151
Summary and top 10	p. 161		

How to read a question box: see page iv at the front of the book.

Concept map — questions clubbed by concept

Each box is one NCERT concept. Numbers: questions in this bank · papers · board papers. Most asked question below.

T1 Asexual reproduction

Do organisms create exact copies? (DNA copying and variation)

4 questions · 4 papers · 0 board · NCERT 7.1, 7.1.1

Most asked: A2 – Assertion (A): DNA copying is necessary during reproduction.

Fission – Amoeba, Leishmania and Plasmodium

9 questions · 19 papers · 8 board · NCERT 7.2.1

Most asked: A8 – Write two differences between binary fission and multiple fission in a tabular form, giving one example o...

Fragmentation and regeneration

9 questions · 10 papers · 8 board · NCERT 7.2.2, 7.2.3

Most asked: A14 – Spirogyra, despite being a multi-cellular organism, still shows a simple reproductive method. Select th...

Budding – Hydra and yeast

9 questions · 11 papers · 8 board · NCERT 7.2.4

Most asked: A23 – Yeast multiplies by which of the following methods

Vegetative propagation

13 questions · 24 papers · 16 board · NCERT 7.2.5

Most asked: A36 – What is vegetative propagation ? List its two advantages.

Spore formation – Rhizopus (bread mould)

6 questions · 10 papers · 5 board · NCERT 7.2.6

Most asked: A46 – Name an organism which reproduces by spore formation. List three conditions favourable for spores t...

T2 Sexual reproduction in flowering plants

Why the sexual mode of reproduction?

9 questions · 11 papers · 6 board · NCERT 7.3, 7.3.1

Most asked: A52 – Assertion (A): Offsprings produced by asexual reproduction are genetically similar to the parents.

Sexual reproduction in flowering plants

24 questions · 48 papers · 31 board · NCERT 7.3.2

Most asked: A68 – What is pollination? Differentiate between self-pollination and cross-pollination.

Theme map (NCERT order)

Sub-theme	NCERT	Q numbers	MCQ	A-R	VSA	SA	LA	Case	Board
Do organisms create exact copies? (DNA copying and	7.1, 7.1.1	A1–A4	1	2	1	–	–	–	0
Fission – Amoeba, Leishmania and Plasmodium	7.2.1	A5–A13	2	1	4	–	1	1	8
Fragmentation and regeneration	7.2.2, 7.2.3	A14–A22	3	1	2	2	1	–	8
Budding – Hydra and yeast	7.2.4	A23–A31	2	–	3	1	3	–	8
Vegetative propagation	7.2.5	A32–A44	4	–	4	2	2	1	16
Spore formation – Rhizopus (bread mould)	7.2.6	A45–A50	1	–	2	1	2	–	5
Why the sexual mode of reproduction?	7.3, 7.3.1	A51–A59	1	2	2	2	1	1	6
Sexual reproduction in flowering plants	7.3.2	A60–A83	8	–	5	4	7	–	31

Must-do 20 — the most repeated questions

Ranked by number of CBSE board exams first, then by total papers. Learn these answers first.

#	Q no.	Question (short)	Type	Board	Papers	Pag
1	A68	What is pollination? Differentiate between self-pollination and cross-pollination.	VSA	7	12 ★★★	154
2	A36	What is vegetative propagation ? List its two advantages.	VSA	4	6 ★★★	141
3	A77	(i) In flowering plants, the process of pollination leads to fertilization. Explain with the help of a well-labelled diagram how the male germ cell from the pollen grain reache...	LA	4	5 ★★	157
4	A8	Write two differences between binary fission and multiple fission in a tabular form, giving one example of each.	VSA	2	5 ★★	130
5	A9	Name the method by which Amoeba and Leishmania reproduce. Write a major difference in the way they divide to produce new individuals.	VSA	2	3 ★★	130
6	A40	Give reasons for the following : (b) Fertilization cannot take place in flowers if pollination does not occur. (c) All multicellular organisms cannot give rise to ne...	SA	2	3 ★★	142
7	A42	Name the most suitable method of raising a banana plant. Is this mode of reproduction sexual or asexual? List any three advantages of growing plants by such a method.	LA	2	3 ★★	143
8	A60	The part of a seed which is a source of food during its germination is :	MCQ	2	3 ★★	152
9	A14	Spirogyra, despite being a multi-cellular organism, still shows a simple reproductive method. Select the correct option with regard to reproduction in Spirogyra :	MCQ	2	2 ★	133
10	A43	(i) Sugarcane does not produce seeds so name the process through which it will be able to reproduce. (ii) List any two advantages of this method. (iii) Besides sugarcane...	LA	2	2 ★	144
11	A61	Part(s) of a flower which attracts insects for pollination is (are)	MCQ	2	2 ★	152
12	A69	Draw a diagram of the longitudinal section of a flower and label Sepal, Petal, Ovary and Stigma.	VSA	2	2 ★	155
13	A10	With the help of diagrams show the different stages of binary fission in Amoeba.	VSA	1	3 ★★	131
14	A46	Name an organism which reproduces by spore formation. List three conditions favourable for spores to germinate and grow.	VSA	1	3 ★★	145
15	A5	Choose the correct order of the stages of binary fission in Leishmania.	MCQ	1	2 ★	129
16	A12	What is binary fission in organisms? With the help of suitable diagrams, describe the mode of reproduction in Amoeba.	LA	1	2 ★	131
17	A23	Yeast multiplies by which of the following methods	MCQ	1	2 ★	136
18	A29	With the help of suitable diagrams, explain the various steps of budding in Hydra.	LA	1	2 ★	138
19	A32	Bryophyllum produces new plant through :	MCQ	1	2 ★	140
20	A47	(A) Name the reproductive and non-reproductive parts of bread mould (Rhizopus). (B) Give any two advantages of sexual reproduction in plants.	VSA	1	2 ★	146

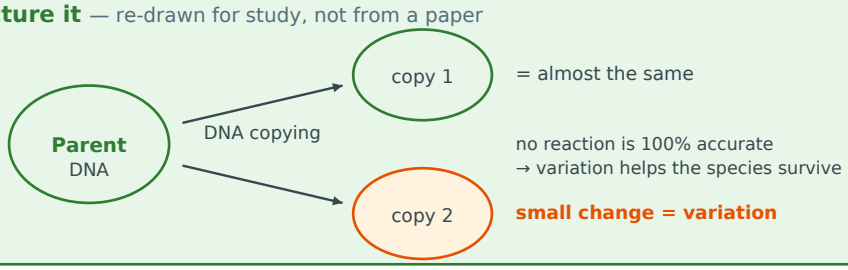
Question bank with answers

T1 Asexual reproduction · NCERT 7.1, 7.1.1

Do organisms create exact copies? (DNA copying and variation)

4 questions
asked in 4 papers
0 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



MCQ · 1

A1 **Multiple Choice** · 1 mark ★ — 1 paper

Organisms can produce their carbon copy by :

(a) Sexual reproduction
(b) Asexual reproduction
(c) Hybridization
(d) None of these

Source
KV Sitapur Periodic Test-II – Q3 [FM p10]

✓ Answer
(b) Asexual reproduction – a single parent makes a copy of its DNA, so the young ones are nearly alike (not exactly alike, because DNA copying is never absolutely accurate).

Assertion–Reason · 2

A2 **Assertion–Reason** · 1 mark ★ — 2 papers

Assertion (A): DNA copying is necessary during reproduction.
Reason (R): DNA copying leads to the transmission of characters from parents to offspring.

(A) Both A and R are true; R explains A
(B) Both A and R are true; R does not explain A
(C) A is true, but R is false
(D) A is false, but R is true

Source
Bangalore Sahodaya Pre-board-1 2024-25 – Q18 [F5 p16]
Practice paper – Q18 [F8 p117, key p123]

✓ Answer
(A) – DNA in the nucleus carries the information for making proteins (body design). Reproduction must make a copy of this DNA, and this copy passes the characters to the offspring.

A3 **Assertion-Reason** · 1 mark ★ 1 paper

Assertion (A): Variation is useful for the survival of a species over time.
Reason (R): The process of DNA copying will have variation each time because biochemical reactions are not reliable.

(A) Both A and R are true; R explains A
(B) Both A and R are true; R does not explain A
(C) A is true, but R is false
(D) A is false, but R is true

Source
Practice paper – Q9 [F6 p431, key p437]

✓ Answer
(B) – Both are true. R tells why variations arise (no biochemical reaction is absolutely reliable); it does not explain why variation helps a species to survive.

Very Short Answer · 1

A4 **Very Short Answer** · 2 marks NEW

Why are the young ones produced by reproduction never exact copies of the parent? How is this variation useful for the species?

Source
NEW – NCERT 7.1 and 7.1.1 (few past questions on this part)

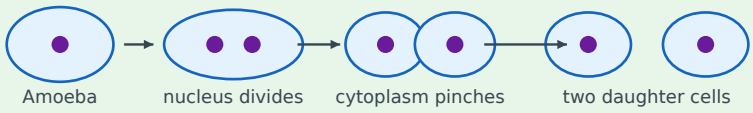
✓ Answer
• DNA copying is not absolutely accurate – the biochemical reactions make small errors, so the new DNA is similar to but not identical with the original; this gives variation (1).
• If the environment changes (e.g. the temperature of water rises), some variants may survive; variation thus helps the species (population) to survive over time (1).

T1 Asexual reproduction · NCERT 7.2.1

Fission – Amoeba, Leishmania and Plasmodium

9 questions
asked in 19 papers
8 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



Binary fission = 1 → 2 cells; multiple fission = 1 → many cells


Leishmania: splits in a definite plane (flagellum)


Plasmodium: multiple fission – many cells

MCQ · 2

A5 Multiple Choice · 1 mark ★ Board ×1 2 papers

Choose the correct order of the stages of binary fission in Leishmania.

(a) I, II, III, IV, V
(b) I, III, II, V, IV
(c) I, III, V, II, IV
(d) I, II, III, V, IV

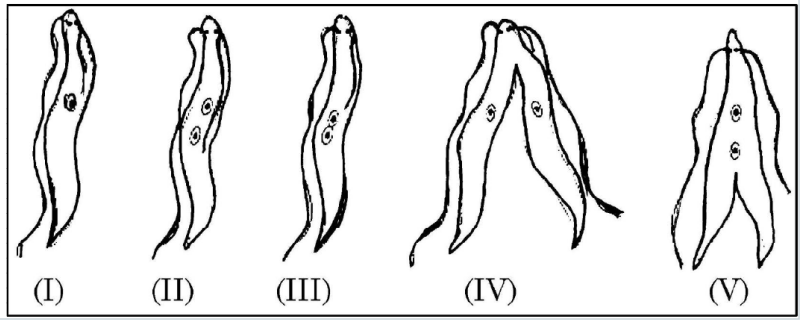


Figure from the question paper (CBSE 2023, 31/6/2)

Source
CBSE 2023 · 31/6/1 Q11 [F1 p545]; 31/6/2 Q12 [F9 OCR p11]
Practice paper – Q8 [F6 p370, key p377]

✔ Answer
(b) I, III, II, V, IV – the nucleus divides first (III, II), then the cell splits lengthwise from one end in a definite plane, near the flagellum (V, IV).

A6 Multiple Choice · 1 mark ★ 1 paper

Amoeba reproduces asexually by

(a) regeneration
(b) budding
(c) binary fission
(d) spore formation

Source
KV Varanasi Region SA-II 2014-15 – Q26 [F5 p279]

✔ Answer
(c) binary fission.

Assertion–Reason · 1

A7 **Assertion–Reason** · 1 mark ★ — 1 paper

Assertion (A): Amoeba always produces two daughter amoebae while Plasmodium divides into many daughter cells.
Reason (R): Amoeba undergoes binary fission while Plasmodium undergoes multiple fission.

(A) Both A and R are true; R explains A
(B) Both A and R are true; R does not explain A
(C) A is true, but R is false
(D) A is false, but R is true

Source
Practice paper – Q18 [F8 p69]

✓ Answer
(A) – In binary fission one cell splits into two; in multiple fission (Plasmodium, the malarial parasite) one cell divides into many daughter cells at the same time.

Very Short Answer · 4

A8 **Very Short Answer** · 2 marks ★★ — Board ×2 — 5 papers

Write two differences between binary fission and multiple fission in a tabular form, giving one example of each.

Source
CBSE old paper (Series RHB/1, 31/1/1) – Q10 [F6 OCR]
CBSE VI (ZWYX) – Q35(a)(ii) [F9 p112]
KVS Lucknow Region test – Q23 [FM p49]
Practice papers – Q13 [F6 p275; F6 p385]

✓ Answer
Binary fission: one cell divides into two daughter cells (½); e.g. Amoeba, Leishmania (½).
Multiple fission: one cell divides into many daughter cells at the same time (½); e.g. Plasmodium – the malarial parasite (½).

A9 **Very Short Answer** · 2 marks ★★ — Board ×2 — 3 papers

Name the method by which Amoeba and Leishmania reproduce. Write a major difference in the way they divide to produce new individuals.

Source
CBSE 2025 · 31/6/3 Q35(a) [F4 p25]
CBSE Supplementary · 31/S/1, 31/S/2 Q36(a)(ii) (yr?) [F4 p232, p290]
Practice paper – Q22 [F6 p493; F8 p4]
Also asked as: Supplementary: "Differentiate between binary fission in Amoeba and Leishmania." Practice paper adds "How does reproduction take place in malarial parasite?" (Ans: multiple fission).

✓ Answer
Both reproduce by binary fission (1). Amoeba can split into two in any plane; Leishmania has a whip-like structure at one end and splits in a definite orientation (lengthwise) with respect to it (1).

A10 **Very Short Answer** · 2 marks ★★ Board ×1 3 papers

With the help of diagrams show the different stages of binary fission in Amoeba.

Source
CBSE old paper (Series LRH/1, 31/1/1) – Q23 [F6 OCR]
KV Sitapur Periodic Test-II – Q9 [FM p11]
KV Varanasi Region SA-II 2016-17 – Q35 [F5 p263]
Also asked as: KV Varanasi: "Name the process of asexual reproduction taking place in Amoeba. Draw the diagram of various stages of this process in correct order."

✔ Answer
Draw 4 stages: Amoeba with one nucleus → nucleus divides into two → constriction in the cytoplasm → two daughter amoebae (2). See "Picture it" above.

A11 **Very Short Answer** · 2 marks ★ 1 paper

List two observations on the basis of which it may be concluded that the given slide shows binary fission in Amoeba.

Source
Practice paper – Q22 [F8 p70, key p75]

✔ Answer
• The nucleus is elongated / has divided into two (1).
• A constriction appears in the cell membrane and cytoplasm, dividing the cell into two nearly equal daughter cells (1).

⚠ **Note:** Prescribed practical: binary fission in Amoeba (prepared slide).

Long Answer · 1

A12 **Long Answer** · 5 marks ★ Board ×1 2 papers

What is binary fission in organisms? With the help of suitable diagrams, describe the mode of reproduction in Amoeba.

Source
CBSE old paper (Series RHB, 31/1) – Q25 OR [F6 p197]
KVS Lucknow Region Pre-board-II – Q35 [FM p26]
Also asked as: KVS Lucknow: "(i) Describe the various steps involved in the process of binary fission with the help of a diagram. (ii) Why do multicellular organisms use complex way of reproduction?" – (ii) their cells are organised into tissues and organs, so they need specialised cells for reproduction.

✔ Answer
• Binary fission: a single-celled organism simply splits into two equal halves during cell division (1).
• In Amoeba the nucleus first divides into two (1); then the cytoplasm pinches (constricts) in the middle (1); the cell splits into two daughter amoebae, each with a nucleus (1). The splitting can take place in any plane.
• Diagrams of the stages (1) – see "Picture it".

Case / Source-based · 1

A13 **Case / Source-based** · 4 marks ★ **Board ×1** 1 paper

All the reproductive methods of living organisms are broadly categorized into two types : 1. Asexual reproduction, and 2. Sexual reproduction. Asexual reproduction involves the participation of a single parent without the formation of gametes, fertilisation and transfer of genetic material. This method is a common means of rapidly increasing offsprings under favourable conditions.
(a) Name the type of fission that occurs in Leishmania and Plasmodium. (1)
(b) Write one advantage of sexual mode of reproduction over asexual reproduction. (1)
(c) Give reasons why : (i) Colonies of yeast fail to multiply in water but multiply in sugar solution.
(ii) Rhizopus individuals do not grow on a dry slice of bread. (2)
OR (c) Name the filamentous structures a student could identify when he collected water from a pond that appeared dark green. How do these organisms multiply? Explain. (2)

Source
CBSE 2023 · 31/2/1 Q38; 31/2/2 Q38; 31/2/3 Q38 [F1 p202, p229, p256]

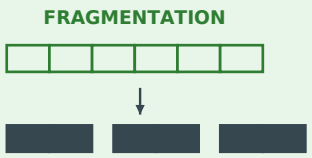
✓ Answer
(a) Leishmania – binary fission; Plasmodium – multiple fission (½ + ½).
(b) It gives more variation (new combinations of DNA from two parents), which helps the species to survive (1).
(c) (i) Sugar gives yeast the food (energy) needed for growth and budding; plain water has no food (1).
(ii) Spores of Rhizopus need moist conditions (and food) to germinate; a dry slice has no moisture (1).
OR (c) Spirogyra (1); the filament simply breaks up into smaller pieces (fragments) on maturing, and each piece grows into a new individual – fragmentation (1).

T1 Asexual reproduction · NCERT 7.2.2, 7.2.3

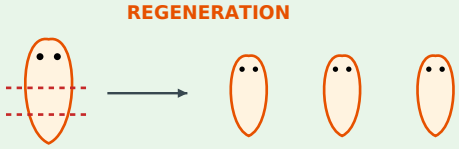
Fragmentation and regeneration

9 questions
asked in 10 papers
8 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



Spirogyra: filament breaks up → each piece grows



Planaria cut into pieces → each piece forms a whole animal

MCQ · 3

A14 Multiple Choice · 1 mark ★ Board ×2 2 papers

Spirogyra, despite being a multi-cellular organism, still shows a simple reproductive method. Select the correct option with regard to reproduction in Spirogyra :

(A) Asexual reproduction by division of cells into two cells

(B) Sexual reproduction by division of cells into many cells

(C) Asexual reproduction by breaking up of Spirogyra filaments into smaller parts

(D) Sexual reproduction by the formation of gametes after meiosis of cells of filaments followed by fusion of male and female gametes

Source
CBSE 2026 · 31/2/1 Q3; 31/2/2 Q1; 31/2/3 Q2 [F9 p311, p379, p451]
CBSE 2026 VI (LMNK2) – Q7 [F1 p61]
Also asked as: VI paper: "Select the option which illustrates the correct method of asexual reproduction in Spirogyra : (A) Budding (B) Regeneration (C) Fragmentation (D) Spore formation" – Ans (C).

✔ Answer
(C) Asexual reproduction by breaking up of Spirogyra filaments into smaller parts – fragmentation.

A15 Multiple Choice · 1 mark ★ Board ×1 1 paper

When an organism breaks into a number of parts and each part develops into a complete organism, it is known as :

(a) budding **(b)** regeneration

(c) vegetative propagation **(d)** spore formation

Source
CBSE VI (ZWYX) – Q12 [F9 p100]

✔ Answer
(b) regeneration – NCERT: if the individual is somehow cut or broken up into many pieces, many of these pieces grow into separate individuals.

⚠ **Note:** If the body breaks up on its own when mature (as in Spirogyra), it is called fragmentation – not given in the options here.

A16 Multiple Choice · 1 mark ★ Board ×1 1 paper

This freshwater organism is known for its amazing ability to reproduce by any of the two methods either regeneration or budding. Identify the organism.

(A) Amoeba **(B)** Hydra

(C) Plasmodium **(D)** Planaria

Source
CBSE 2026 VI (E7FDG) – Q4 [F9 p69]

✔ Answer
(B) Hydra – it shows regeneration and also reproduces by budding.

Assertion–Reason · 1

A17 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Regeneration is getting a full organism back from its body parts.
Reason (R): In grafting, the stock is placed over the scion.

(A) Both A and R are true; R explains A
(B) Both A and R are true; R does not explain A
(C) A is true, but R is false
(D) A is false, but R is true

Source
Practice paper – Q18 [F6 p476, key p482]

✔ Answer
(C) A is true, but R is false – in grafting the scion (the cut shoot) is placed over the stock (the rooted plant), not the other way round.

⚠ **Note:** KEY CORRECTED: the paper's key gives (B). R is wrong, so the answer is (C).

Very Short Answer · 2

A18 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Which one of the two multicellular organisms Spirogyra and Planaria reproduces by regeneration and why? Give an example of any other organism which can also reproduce by the same process.

Source
CBSE 2022 Term-II · 31/1/1 Q4; 31/1/3 Q3 [F9 p168, p254]

✔ Answer
• Planaria (½).
• If its body is cut into many pieces, each piece grows into a complete organism – specialised cells multiply and change into the different cells and tissues (1).
• Hydra (½).

A19 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

"Fragmentation cannot be a method of reproduction in all multicellular organisms." Justify this statement.

Source
CBSE Supplementary · 31/S/1, 31/S/2 Q36(a)(iii) (yr?) [F4 p232, p290]
Also asked as: Asked in CBSE 2023 (31/6) as a give-reason: "All multicellular organisms cannot give rise to new individuals through fragmentation or regeneration."

✔ Answer
• Complex multicellular organisms have their cells organised into tissues, and tissues into organs placed at definite positions in the body (1).
• Such a carefully organised body cannot be rebuilt from any piece by simple cell division; they need specialised cells (germ cells) for reproduction (1).

Short Answer · 2

A20 Short Answer · 3 marks ★ Board ×1 1 paper

(a) Explain the process of regeneration in Planaria.
(b) How is regeneration different from reproduction?

Source
CBSE old paper (Series RSH/1, 31/1/1) – Q12 [F6 OCR]

✓ Answer
(a) Planaria can be cut into any number of pieces and each piece grows into a complete organism (1). Specialised cells multiply to make a large number of cells; these change into different cell types and tissues in an organised order – development (1).
(b) Regeneration is not the same as reproduction – most organisms do not depend on being cut up to be able to reproduce (1).

A21 Short Answer · 3 marks ★ 1 paper

Planarians can regenerate lost body parts due to the presence of specialised cells called neoblasts. These specialised cells multiply and make a large mass of cells from which different cells undergo changes to become different types of cells and tissues.
(a) In plants, in which type of tissue are cells that have a function similar to neoblasts found? (1)
(b) How do the characteristics of a planarian formed by regeneration compare with the characteristics of the original planarian? Justify your answer. (2)

Source
CBSE competency item bank – How do Organisms Reproduce? Q11 [F4 p743, key p745]

✓ Answer
(a) Meristematic tissue (1).
(b) They will be the same (1), because regeneration does not involve the mixing of gametes – the new planarian gets the same DNA as the original (1).

Long Answer · 1

A22 **Long Answer** · 5 marks ★ Board ×1 1 paper

(a) What is fragmentation in organisms? Name a multicellular organism which reproduces by this method.
(b) What is regeneration in organism? Describe regeneration in Planaria with the help of a suitable diagram.

Source
CBSE old paper (Series RHB/1, 31/1/1) – Q25 OR [F6 OCR]
Also asked as: KVS Ahmedabad Pre-board 2025-26 Q16(B)(i): "What is regeneration? Name two organisms which exhibit this process." (Hydra, Planaria)

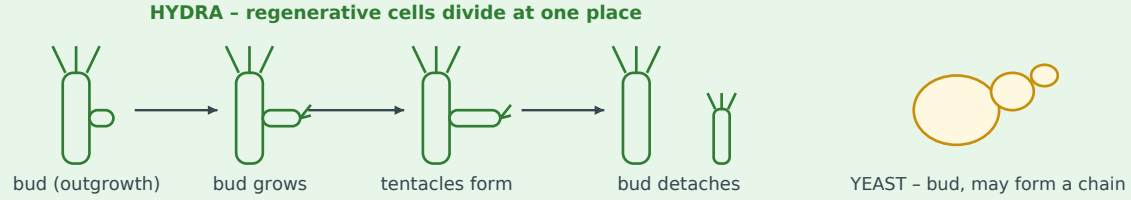
✔ Answer
(a) Fragmentation: on maturing, the organism simply breaks up into smaller pieces and each piece grows into a new individual (1); e.g. Spirogyra (1).
(b) Regeneration: the ability of a fully differentiated organism to give rise to new individual organisms from its body parts (1). Planaria cut into pieces – each piece grows into a complete planarian by division and development of specialised cells (1); diagram (1).

T1 Asexual reproduction · NCERT 7.2.4

Budding – Hydra and yeast

9 questions
asked in 11 papers
8 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



MCQ · 2

A23 **Multiple Choice** · 1 mark ★ Board ×1 2 papers

Yeast multiplies by which of the following methods

(A) Fragmentation
(B) Binary Fission
(C) Multiple Fission
(D) Budding

Source
CBSE 2026 · 31/5/2 Q2 [F4 p494]
KVS Pre-board 2022-23 – Q13 [FM p16]
Also asked as: KVS: "Asexual reproduction takes place through budding in (a) amoeba (b) plasmodium (c) yeast (d) leishmania" – Ans (c).

✔ Answer
(D) Budding.

A24 **Multiple Choice** · 1 mark ★ 1 paper

In the slides showing binary fission in Amoeba and budding in yeast, the correct observations are:

A. The daughter cells of Amoeba and the bud of Yeast are smaller than their respective parental cells.

B. The daughter cells of Amoeba and the bud of Yeast are the same sizes as their respective parental cells.

C. The daughter cells of Amoeba are bigger than the parent cell but the bud of yeast is smaller than the parent.

D. The daughter cells of Amoeba are smaller than the parent but the bud of Yeast is larger than the parent.

Source
Practice paper – Q6 [F6 p384]

✓ Answer
(A) – the two daughter amoebae are smaller than the parent Amoeba, and the bud of yeast is smaller than the parent yeast cell.

Very Short Answer · 3

A25 **Very Short Answer** · 2 marks ★ **Board ×1** 1 paper

Draw labelled diagrams to show different stages of budding in Hydra.

Source
CBSE 2025 · 31/1/1 Q22; 31/1/2 Q25; 31/1/3 Q23 [F9 p194, p239, p280]

✓ Answer
Stages: parent Hydra with tentacles → small bud (outgrowth) on the side → bud grows tentacles → mature bud detaches as a new Hydra (2). Label: parent, bud, tentacles. See "Picture it".

A26 **Very Short Answer** · 2 marks ★ **Board ×1** 1 paper

Write the main steps to culture yeast in the laboratory.

Source
CBSE 2025 · 31/2/1 Q24(b); 31/2/2 Q24(b); 31/2/3 Q24(b) [F9 p352, p420, p492]

✓ Answer
• Dissolve about 10 g sugar in 100 mL water; take 20 mL of this solution in a test tube and add a pinch of yeast granules (1).
• Put a cotton plug and keep it in a warm place; after 1–2 hours put a drop on a slide, cover and see under the microscope – yeast cells with buds are seen (1).

⚠ **Note:** This is NCERT Activity 7.3.

A27 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Students were asked to observe the permanent slides showing different stages of budding in yeast under high power of a microscope.
(a) Which adjustment screw (coarse/fine) were you asked to move to focus the slides?
(b) Draw three diagrams in correct sequence showing budding in yeast.

Source
CBSE old paper (Series RLH) [F9 p164]

✔ Answer
(a) Fine adjustment screw (under high power) (1).
(b) Yeast cell → small bud growing out → bud grown (may form a chain of buds) (1).

⚠ **Note:** Prescribed practical: budding in yeast (slide).

Short Answer · 1

A28 **Short Answer** · 3 marks ★ Board ×1 1 paper

Explain with the help of a labelled diagram, the process of reproduction in Hydra by budding. Name the cells used for reproduction in this process.

Source
CBSE 2024 · 31/4/1 (D4CBA) Q29(a) [F1 p393]

✔ Answer
• A bud develops as an outgrowth due to repeated cell division at one specific site (1).
• The bud grows into a tiny individual; when fully mature it detaches from the parent and becomes a new independent Hydra (1).
• Regenerative cells are used; labelled diagram (1).

Long Answer · 3

A29 **Long Answer** · 5 marks ★ Board ×1 2 papers

With the help of suitable diagrams, explain the various steps of budding in Hydra.

Source
CBSE old paper (Series RHB, 31/1) – Q25 [F6 p197]
Practice paper – Q35 [F8 p86, key p95]

✔ Answer
• Hydra uses regenerative cells for reproduction (1).
• At one specific site, repeated cell division makes an outgrowth – the bud (1).
• The bud grows, develops a mouth and tentacles (1).
• When fully mature it detaches from the parent and becomes a new independent individual (1).
• Labelled diagrams of the stages (1).

A30 **Long Answer** · 5 marks ★ Board ×1 1 paper

(a) Name the method by which Amoeba and Leishmania reproduce. Write a major difference in the way they divide to produce new individuals.
(b) What is asexual reproduction? Explain the process of budding in Hydra. Give two methods used to grow rose and jasmine plants by vegetative propagation.

Source
CBSE 2025 · 31/6/3 Q35 [F4 p25]

✔ Answer
(a) Binary fission (1); Amoeba splits in any plane, Leishmania splits lengthwise in a definite plane with respect to its whip-like flagellum (1).
(b) Asexual reproduction – a new individual is produced from a single parent, without gametes (1). Budding in Hydra – a bud forms as an outgrowth by repeated cell division at one site, grows into a tiny Hydra and detaches when mature (1). Rose and jasmine – layering and grafting (cuttings) (1).

A31 **Long Answer** · 5 marks ★ Board ×1 1 paper

(i) Name and explain the two modes of asexual reproduction observed in hydra.
(ii) What is vegetative propagation? List two advantages of using this technique.

Source
CBSE 2023 · 31/4/1 Q35; 31/4/2 Q35; 31/4/3 Q34 [F1 p371, p422, p446]

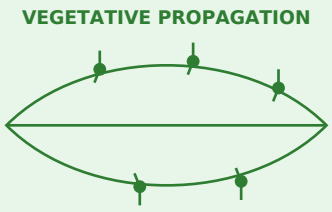
✔ Answer
(i) Budding – a bud develops as an outgrowth by repeated cell division at one site, grows into a tiny Hydra and detaches (1½). Regeneration – if Hydra is cut into pieces, each piece can grow into a whole Hydra (1½).
(ii) Vegetative propagation: new plants are grown from parts like root, stem and leaves (1). Advantages: plants bear flowers and fruits earlier than those produced from seeds; plants that have lost the capacity to produce seeds (banana, orange, rose, jasmine) can be grown; all plants are genetically similar to the parent (any two, ½ + ½).

T1 Asexual reproduction · NCERT 7.2.5

Vegetative propagation

13 questions
asked in 24 papers
16 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



Bryophyllum: buds in the notches of the leaf

New plant from root, stem or leaf – no seed, one parent
Examples: sugarcane, rose, grapes (layering/grafting), banana, orange, jasmine (have lost the capacity to make seeds)
+ flowers & fruits come earlier
+ seedless plants can be grown
+ all plants genetically like the parent
– no variation: one disease can wipe out all

MCQ · 4

A32 Multiple Choice · 1 mark ★ Board ×1 2 papers

Bryophyllum produces new plant through :

(A) Apical buds formed on the tip of the plant
(B) Vegetative buds produced in the notches of the leaf
(C) Flowers produced in the notches of the branches
(D) Fruits formed on the branches of the plant

Source
CBSE 2025 · 31/2/1 Q9 [F9 p344]
KVS Lucknow Region test – Q7 [FM p47]
Also asked as: KVS: "Bryophyllum can be propagated vegetatively by the (a) stem (b) leaf (c) root (d) flower" – Ans (b).

✔ Answer
(B) Vegetative buds produced in the notches of the leaf.

A33 Multiple Choice · 1 mark ★ Board ×1 1 paper

The plants that can be raised by the method of vegetative propagation are :

(A) Sugarcane, roses, grapes
(B) Sugarcane, mustard, potato
(C) Banana, orange, mustard
(D) Papaya, mustard, potato

Source
CBSE 2024 · 31/4/1 (D4CBA) Q8 [F1 p383]

✔ Answer
(A) Sugarcane, roses, grapes.

A34 Multiple Choice · 1 mark ★ Board ×1 1 paper

Which one of the following statements is not correct for the plants raised by vegetative propagation ?

(A) Can bear flowers and fruits earlier than those produced from seeds.
(B) Those plants that have lost the capacity to produce seeds can be grown.
(C) As compared to the parent plant, vegetatively propagated plants show more variations.
(D) All the plants produced in this way are genetically similar to the parent plant.

Source
CBSE 2025 · 31/2/2 Q9 [F9 p414]

✔ Answer
(C) – vegetatively grown plants are genetically similar to the parent, so they show very little variation.

A35 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Which of the following statements correctly identify the advantages of vegetative propagation?
(i) Plants can bear flowers and fruits earlier than those produced by seeds.
(ii) The new plants develop as an outgrowth on the parent plant and can be removed easily.
(iii) Plants that have lost the capacity to produce seeds can be propagated.
(iv) All plants produced are genetically similar to parent plant.

(A) (iii), (iv) **(B)** (i), (iii), (iv)
(C) (i), (ii) **(D)** (i), (iv) only

Source
CBSE 2026 · 31/8/3 (Q no. lost in OCR) [F4 p157]

✓ Answer
(B) (i), (iii) and (iv) – these are the advantages given in NCERT; (ii) describes budding, not an advantage.

⚠ **Note:** Option letters read from a damaged scan; check with the paper if possible.

Very Short Answer · 4

A36 **Very Short Answer** · 2 marks ★★★ Board ×4 6 papers

What is vegetative propagation ? List its two advantages.

Source
CBSE VI 31(B)/S (CDBA/S) – Q26(a) (yr?) [F1 p13]
CBSE old paper (Series BRH/1, 31/1/1) – Q8 [F5 OCR p5]
CBSE old paper (Series BRH/2, 31/2/1) – Q2 [F5 OCR p45]
CBSE old paper (Series RHB, 31/1) – Q10 [F6 p194]
KV Varanasi Region SA-II 2014-15 – Q4 [F5 p276]
Practice paper – Q10(b) [F6 p323; F6 p339]
Also asked as: BRH/1: "List two advantages of vegetative reproduction practised in case of an orange plant." · BRH/2: "... Select two plants raised by this method: banana, gram, pea, rose, tomato, wheat" (banana, rose) · RHB: "List any four reasons for vegetative propagation being practised in the growth of some type of plants."

✓ Answer
• Vegetative propagation: new plants are grown from vegetative parts such as the root, stem or leaves under suitable conditions (1).
• Advantages (any two, ½ each): plants bear flowers and fruits earlier than those grown from seeds; plants that have lost the capacity to produce seeds (banana, orange, rose, jasmine) can be grown; all plants are genetically similar to the parent, so good characters are kept.

A37 **Very Short Answer** · 1 mark ★ 1 paper

Plants produced through vegetative propagation are genetically identical to their parents. What could be the biggest disadvantage of vegetative propagation?

Source
CBSE competency item bank – How do Organisms Reproduce? Q8 [F4 p743, key p745]

✓ Answer
All the plants are alike, so a disease (pathogen) that attacks one can wipe out the whole crop; also no new variety is produced (1).

A38 **Very Short Answer** · 2 marks ★ 1 paper

A farmer bought some strawberries and liked the taste. He decided to grow his own strawberries that should have the same taste.
(a) Which method of cultivation should the farmer adopt?
(b) Why would the farmer choose this method?

Source
CBSE competency item bank – How do Organisms Reproduce? Q9 [F4 p743, key p745]

✔ Answer
(a) Vegetative propagation – an asexual method (1).
(b) The new plants are genetically similar to the parent, so the fruit keeps the same taste (1).

A39 **Very Short Answer** · 2 marks ★ 1 paper

State TWO points of similarities between the processes of reproduction in hydra and bryophyllum.

Source
CBSE Competency Focused Practice Questions – Q151 [F6 p81, key p83]

✔ Answer
• Both are asexual – only one parent is involved and no gametes are formed (1).
• In both, the new individual develops from a bud, and the offspring are genetically similar to the parent (1).

Short Answer · 2

A40 **Short Answer** · 3 marks ★★ Board ×2 3 papers

Give reasons for the following :
(b) Fertilization cannot take place in flowers if pollination does not occur.
(c) All multicellular organisms cannot give rise to new individuals through fragmentation or regeneration.
(d) Vegetative propagation is practised for growing only some type of plants.

Source
CBSE 2023 · 31/6/1 Q35 [F1 p559–561]; 31/6/2 Q36 [F9 OCR p25]
CBSE 2026 · 31/4/1 Q13(c); 31/4/3 Q14(c) [F4 p372, p436]
Practice paper – Q35 [F6 p478, key p486]
Also asked as: CBSE 2026: "Give reasons: Vegetative propagation is advantageous in some plants."

✔ Answer
(b) The male germ cells are in the pollen grains; unless pollen reaches the stigma (pollination), the male germ cell cannot reach the female germ cell in the ovule (1).
(c) Complex organisms have cells organised into tissues and organs at definite positions; they cannot rebuild the whole body from any part, so they need specialised reproductive cells (1).
(d) Only some plants (e.g. banana, sugarcane, rose, orange) have lost the capacity to produce seeds or grow well from stems/leaves; vegetative propagation is used for them to get plants early and with the same characters (1).

⚠ **Note:** Parts (a) and (e) of this question are in Chapter 8 (Q63).

A41 **Short Answer** · 3 marks ★ Board ×1 1 paper

(a) Which technique would you use for the propagation of varieties of grapes and roses?
(b) Mention the parts of plants that can grow vegetatively.
(c) State the role of pollen grains in a flower.

Source
CBSE 2026 · 31/7/2 Q14 [F4 p52]

✓ Answer
(a) Vegetative propagation – layering or grafting (1).
(b) Root, stem and leaves (buds on them) (1).
(c) Pollen grains contain the male germ cells; after pollination the pollen grain grows a tube that carries the male germ cell to the ovule for fertilisation (1).

Long Answer · 2

A42 **Long Answer** · 5 marks ★★ Board ×2 3 papers

Name the most suitable method of raising a banana plant. Is this mode of reproduction sexual or asexual? List any three advantages of growing plants by such a method.

Source
CBSE 2026 VI (E7FDG) – Q16(a) [F9 p75]
CBSE VI (ZWYX) – Q36(a) [F9 p143]
CBSE Sample Paper 2025-26 – Q16(A) [F5 p285; F6 p229; F8 p307]
Also asked as: SQP 2025-26: "Puneet wanted to grow banana plants. (i) Should he opt for seeds or any alternate method? Justify. (ii) Offsprings of a banana plant usually show very little variation. What causes variation and are variations good or bad? Justify." – (ii) small errors in DNA copying cause variation; variation is good as it helps a species survive changes.

✓ Answer
• Vegetative propagation (from suckers / stem parts) (1); it is asexual – only one parent, no gametes (1).
• Advantages (1 each): plants bear flowers and fruits earlier than seed-grown plants; plants like banana that have lost the capacity to produce seeds can be grown; all plants are genetically similar to the parent, so good qualities are kept.

A43 **Long Answer** · 5 marks ★ Board ×2 2 papers

(i) Sugarcane does not produce seeds so name the process through which it will be able to reproduce.
(ii) List any two advantages of this method.
(iii) Besides sugarcane, give two more examples of plants that reproduce by this method.
(iv) Why regeneration is not possible in all the types of animals?

Source
CBSE 2026 · 31/5/1 Q16 OR; 31/5/2 Q16; 31/5/3 Q16 [F4 p470, p502, p532]
CBSE 2026 VI (LMNK2) – Q16(a) [F1 p67]
Also asked as: VI paper: "(i) Sugarcane and roses are mostly grown by vegetative propagation. Define this mode of reproduction. (ii) List two advantages. (iii) Distinguish between unisexual and bisexual flowers with one example of each."

✔ Answer
(i) Vegetative propagation (stem cuttings) (1).
(ii) Plants bear flowers and fruits earlier; seedless plants can be grown; offspring are genetically similar to the parent (any two, 1 + 1).
(iii) Banana, rose, orange, grapes, jasmine (any two) (1).
(iv) In complex animals cells are organised into tissues and organs; they do not have enough specialised cells that can multiply and form all the body parts again (1).

Case / Source-based · 1

A44 **Case / Source-based** · 4 marks ★ Board ×1 1 paper

Plantation drives are often carried out especially during monsoon season for the protection of our environment. Such programmes need a lot of saplings for tree plantation. Plants are propagated by sexual or asexual means in fields and nurseries. Over the years horticulturists have developed asexual methods that use vegetative parts of the plants to multiply. Many plants can reproduce by this method naturally as well as by artificial means.
(a) Which specific part of the plant is used for sexual and asexual means of propagation to produce a new plant? (1)
(b) Give one example of (i) a flower, and (ii) a fruit grown by vegetative propagation. (1)
(c) List two advantages of growing plants by vegetative propagation. (2)
OR (c) Describe an activity to show how potatoes reproduce asexually. (2)

Source
CBSE Supplementary · 31/S/1 Q38; 31/S/2 Q38; 31/S/3 Q38 (yr?) [F4 p209, p267, p321]

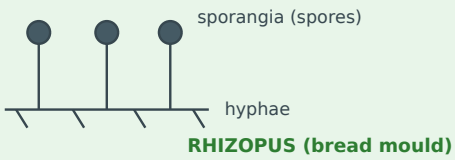
✔ Answer
(a) Sexual – the flower (seed formed after fertilisation); asexual – vegetative parts such as root, stem or leaf (½ + ½).
(b) (i) Rose / jasmine (ii) banana / orange / grapes (½ + ½).
(c) Plants bear flowers and fruits earlier; seedless plants can be grown; the new plants are genetically similar to the parent (any two, 1 + 1).
OR (c) Take a potato with a few "eyes" (buds); keep it in moist soil / shallow water; after some days the buds sprout into shoots and roots appear – each bud can give a new plant (2).

T1 Asexual reproduction · NCERT 7.2.6

Spore formation – Rhizopus (bread mould)

6 questions
asked in 10 papers
5 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



RHIZOPUS (bread mould)

Sporangium ("blob on a stick") holds many spores
Spores have thick walls → survive bad conditions
On a moist surface a spore grows into a new Rhizopus
Hyphae = thread-like, non-reproductive part

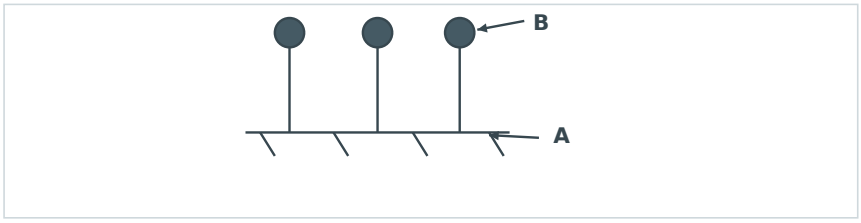
MCQ · 1

A45 Multiple Choice · 1 mark ★

Board ×1 1 paper

In bread mould, the structures labelled A and B respectively are

(A) hyphae and spore
(B) root and sporangium
(C) hyphae and sporangium
(D) root and spores



Re-drawn figure (for study) – A: thread-like part, B: blob at the top of an upright thread

Source
CBSE Supplementary · 31/S/1 Q11; 31/S/2 (yr?) [F4 p191, p245]

✓ Answer
(C) hyphae and sporangium.

Very Short Answer · 2

A46 Very Short Answer · 2 marks ★★

Board ×1 3 papers

Name an organism which reproduces by spore formation. List three conditions favourable for spores to germinate and grow.

Source
CBSE old paper (Series BRH, 31/1) – Q7 [F6 OCR]
KVS Pre-board 2022-23 – Q23 [FM p17]
Practice paper – Q14 [F6 p356, key p363]
Also asked as: KVS: "How will an organism be benefitted if it reproduces through spore formation?" – many spores are formed; thick walls protect them in unfavourable conditions; they spread easily and grow when conditions are moist.

✓ Answer
Rhizopus (bread mould) (½). Spores germinate when they come in contact with a moist surface (½), with food available (½) and suitable warmth (½).

A47 **Very Short Answer** · 2 marks ★ Board ×1 2 papers

(A) Name the reproductive and non-reproductive parts of bread mould (Rhizopus).
(B) Give any two advantages of sexual reproduction in plants.

Source
CBSE 2026 · 31/8/2 Q12 [F4 p129]
Practice paper – Q10(a) [F6 p323, key p331]

✔ Answer
(A) Reproductive – sporangia (containing spores); non-reproductive – hyphae (thread-like parts) (½ + ½).
(B) It gives variation (new combinations of characters) (½); variation helps the species to survive changes in the environment (½).

Short Answer · 1

A48 **Short Answer** · 3 marks ★ 1 paper

Differentiate between Spore formation & Multiple fission with suitable diagrams.

Source
KV Varanasi Region SA-II 2016-17 – Q15 [F5 p260]

✔ Answer
• Spore formation: in multicellular organisms like Rhizopus; spores are formed in sporangia on upright hyphae (1).
• Multiple fission: in single-celled organisms like Plasmodium; one cell divides into many daughter cells at the same time (1).
• Diagrams (1).

Long Answer · 2

A49 **Long Answer** · 5 marks ★ Board ×1 2 papers

(i) What happens when :
(1) Leaves of Bryophyllum fall on the soil?
(2) Planaria is cut into many pieces?
(3) Sporangia of Rhizopus on maturation liberate spores?
Mention the modes of reproduction in each of the above three cases.
(ii) Write the changes that occur in a flower once the fertilisation has taken place.

Source
CBSE 2023 · 31/5/1 Q35(b); 31/5/2 Q35(b); 31/5/3 Q35(b) [F1 p474, p501, p528]
Practice paper – Q16 [F6 p307; F8 p23]
Also asked as: Practice paper: "Name the mode of reproduction of Planaria, Hydra and Rhizopus and state the important feature of each mode. We can develop new plants from the leaves of Bryophyllum. Comment."

✔ Answer
(i) (1) Buds in the notches of the leaf grow into new plants – vegetative propagation (1). (2) Each piece grows into a complete planarian – regeneration (1). (3) Spores that fall on a moist surface germinate into new Rhizopus – spore formation (1).
(ii) The zygote divides many times to form the embryo within the ovule; the ovule develops a tough coat and becomes the seed; the ovary grows and ripens into the fruit; petals, sepals, stamens, style and stigma shrivel and fall off (2).

A50 **Long Answer** · 5 marks ★ Board ×1 1 paper

(i) What are spores? On which structures are they formed? How do they overcome unfavourable conditions? Name the organism which multiplies with the help of these structures.
(ii) Give two reasons why some plants are grown by the method of vegetative propagation. List two methods used to grow plants vegetatively.

Source
CBSE 2024 · 31/3/1 Q35(a) [F1 p281]

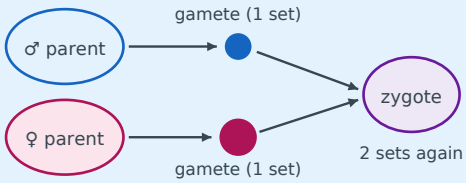
✔ Answer
(i) Spores are tiny reproductive units (1); formed in blob-on-a-stick structures called sporangia (½); they are covered by thick walls that protect them until they come in contact with a moist surface (1); Rhizopus (½).
(ii) Plants that have lost the capacity to produce seeds can be grown; plants bear flowers and fruits earlier / are similar to the parent (1). Methods: layering, grafting (cutting) (1).

T2 Sexual reproduction in flowering plants · NCERT 7.3, 7.3.1

Why the sexual mode of reproduction?

9 questions
asked in 11 papers
6 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



Germ cells carry HALF the DNA → fusion restores the full amount
DNA of two parents mixes → new combinations = MORE variation
Asexual: 1 parent, no gametes, offspring nearly identical
Sexual: 2 parents, gametes fuse, offspring vary

MCQ · 1

A51 Multiple Choice · 1 mark ★

Board ×1 1 paper

Which one of the following statements is TRUE for Hydra, Amoeba and Spirogyra ?

(A) They are multicellular.
(B) They are unicellular.
(C) They reproduce sexually.
(D) They reproduce asexually.

Source
CBSE 2024 · 31/3/2 Q10 [F1 p299]

✓ Answer
(D) They reproduce asexually – Amoeba by fission, Hydra by budding, Spirogyra by fragmentation.

Assertion-Reason · 2

A52 Assertion-Reason · 1 mark ★

Board ×1 2 papers

Assertion (A): Offsprings produced by asexual reproduction are genetically similar to the parents.
Reason (R): Asexual reproduction involves a single parent.

(A) Both A and R are true; R explains A
(B) Both A and R are true; R does not explain A
(C) A is true, but R is false
(D) A is false, but R is true

Source
CBSE 2024 · 31/3/1 Q18; 31/3/3 Q19 [F1 p273, p337]
Practice paper – Q8 [F6 p323]

✓ Answer
(A) – With only one parent, the offspring get a copy of the same DNA, so they are genetically similar to the parent.

A53 **Assertion-Reason** · 1 mark ★ 1 paper

Assertion (A): Plants that can reproduce asexually cannot reproduce sexually.
Reason (R): Asexual reproduction does not involve the production of gametes.

(A) Both A and R are true; R explains A
(B) Both A and R are true; R does not explain A
(C) A is true, but R is false
(D) A is false, but R is true

Source
CBSE Competency Focused Practice Questions – Q79 [F6 p51]

✓ Answer
(D) A is false, but R is true – many plants (e.g. potato, rose, sugarcane) reproduce both asexually and sexually.

⚠ **Note:** In the CFPQ booklet this option is printed as "C".

Very Short Answer · 2

A54 **Very Short Answer** · 2 marks ★ Board ×1 2 papers

List two distinguishing features between sexual reproduction and asexual reproduction.

Source
CBSE VI 31(B)/S (CDBA/S) – Q26(b) (yr?) [F1 p13]
Practice paper – Q10 [F6 p258, key p266]
Also asked as: Practice paper adds: "Which species is likely to have better chances of survival, the one reproducing asexually or the one reproducing sexually? Justify." – sexually; variation helps survival.

✓ Answer
Sexual: two parents are involved; gametes are formed and fuse; offspring show more variation.
Asexual: a single parent; no gametes; offspring are nearly identical to the parent (any two, 1 + 1).

A55 **Very Short Answer** · 2 marks ★ 1 paper

What could be the TWO most likely reasons for unicellular organisms to reproduce only through asexual reproduction?

Source
CBSE competency item bank – How do Organisms Reproduce? Q10 [F4 p743, key p745]

✓ Answer
• They can produce a large number of offspring in a short time (1).
• A single cell has no specialised reproductive tissues; the offspring (copies of the parent) are already suited to the same environment (1).

Short Answer · 2

A56 **Short Answer** · 3 marks ★ Board ×1 1 paper

"Each organism has two sets of all genes, one inherited from each parent i.e. both parents contribute equally to the DNA of the progeny during sexual reproduction". If such is the case, then how is the stability of DNA of the species ensured? Discuss.

Source
CBSE 2026 · 31/8/1 Q14; 31/8/2 Q13; 31/8/3 Q13 [F4 p99, p131, p163]

✓ Answer
• Specialised germ cells (gametes) are formed that have only one set of genes – half the amount of DNA of the body cells (1).
• When a male and a female germ cell fuse at fertilisation, the zygote gets the full, original number of chromosomes and amount of DNA (1).
• So the DNA content stays the same generation after generation – the DNA of the species remains stable (1).

A57 **Short Answer** · 3 marks ★ Board ×1 1 paper

List six specific characteristics of sexual reproduction.

Source
CBSE old paper (Series RLH) – Q11 [F9 p154]

✓ Answer
Two parents are involved; male and female gametes are formed; the gametes have half the number of chromosomes; gametes fuse (fertilisation) to form a zygote; the zygote has the full number of chromosomes; the offspring show variation (½ each).

Long Answer · 1

A58 **Long Answer** · 5 marks ★ Board ×1 1 paper

(a) List three distinguishing features between sexual and asexual types of reproduction.
(b) Explain why variations are observed in the offsprings of sexually reproducing organisms?

Source
CBSE old paper (Series RSH/1, 31/1/1) – Q21 [F6 OCR]

✓ Answer
(a) Sexual: two parents / gametes formed and fused / offspring vary; Asexual: one parent / no gametes / offspring nearly identical (3).
(b) Each offspring gets one set of genes from each parent through the germ cells; the DNA of two different individuals is combined in new ways, so each offspring is a new combination – variation (2).

Case / Source-based · 1

A59 **Case / Source-based** · 4 marks ★ 1 paper

Water hyacinths reproduce both sexually and asexually. They reproduce sexually by producing seeds through flowers, and asexually by bud formation or fragmentation. It undergoes reproduction through either of the methods depending on environmental conditions. Water hyacinths bloom freely in water-rich conditions whereas, reproduction for survival is more effort-intensive in water-scarce conditions.
(a) Explain why this variation in reproduction is required in water hyacinths. (2)
(b) Which mode of reproduction is likely to occur in the following conditions? Justify: (i) its natural, water-rich environment (ii) scarcity of water. (2)

Source
CBSE Competency Focused Practice Questions – Q40 [F6 p33–34, key p35]

✔ Answer
(a) Each population lives in a habitat whose conditions can change beyond its control (1); having variation gives a greater chance of survival through such changes (1).
(b) (i) Asexual reproduction – in its natural environment the plant uses the quick, energy-saving method (1). (ii) Sexual reproduction – under stress the plant makes the extra effort, which gives variation and a better chance of survival (1).

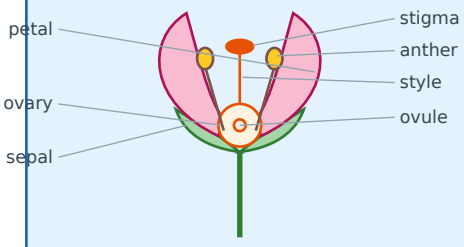
⚠ **Note:** Condition (i) is written from the answer key; the scan cut it off.

T2 Sexual reproduction in flowering plants · NCERT 7.3.2

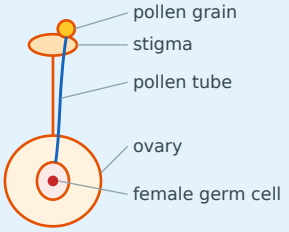
Sexual reproduction in flowering plants

24 questions
asked in 48 papers
31 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — re-drawn for study, not from a paper



L.S. of a flower



Germination of pollen on stigma

After fertilisation:
zygote → embryo
ovule → seed
ovary → fruit
petals, sepals, stamens, style, stigma fall off

Seed: plumule → shoot,
radicle → root,
cotyledon stores food

MCQ · 8

A60 Multiple Choice · 1 mark ★★ Board ×2 3 papers

The part of a seed which is a source of food during its germination is :

(A) Radicle
(B) Cotyledon
(C) Plumule
(D) Embryo

Source
CBSE VI 31(B)/S (EFGH/S) – Q11 (yr?) [F1 p36]
CBSE 2024 · 31/4/1 (D4CBA) Q9 [F1 p383]
Practice paper – Q7 [F6 p415]
Also asked as: CBSE–British Council item: "Which row is the function of cotyledons in a germinating dicot seed?" – To provide nutrients to the embryo [F5 p183].

✓ Answer
(B) Cotyledon – it stores food for the embryo.

A61 Multiple Choice · 1 mark ★ Board ×2 2 papers

Part(s) of a flower which attracts insects for pollination is (are)

(A) petals and Sepals
(B) anther and Stigma
(C) petals only
(D) sepals only

Source
CBSE 2024 · 31/3/1 Q9; 31/3/2 Q18 [F1 p267, p301]
CBSE VI 31(B)/S (CDBA/S) – Q9 (yr?) [F1 p7]

✓ Answer
(C) petals only.

A62 Multiple Choice · 1 mark ★ Board ×1 2 papers

The part of a seed that stores food, the future root and the future shoot respectively are :

(A) Plumule, radicle, cotyledon
(B) Cotyledon, plumule, radicle
(C) Cotyledon, radicle, plumule
(D) Radicle, plumule, cotyledon

Source
CBSE VI (ZWYX) – Q14 [F9 p129]
KV Varanasi Region SA-II 2016-17 – Q28 [F5 p262]
Also asked as: KV Varanasi: "The part of the embryo which always grows upwards & develops into shoot is" – Plumule.

✓ Answer
(C) Cotyledon, radicle, plumule.

A63 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Plants which bear unisexual flowers are :

(a) Mustard and Papaya
(b) Hibiscus and Watermelon
(c) Mustard and Hibiscus
(d) Watermelon and Papaya

Source
CBSE 2023 · 31/2/1 Q11; 31/2/2 Q15; 31/2/3 Q14 [F1 p186, p215, p240]

✓ Answer
(d) Watermelon and Papaya – their flowers have either stamens or carpels.

A64 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

The correct/true statement(s) for a bisexual flower is/are :
(i) They possess both stamen and pistil.
(ii) They possess either stamen or pistil.
(iii) They exhibit either self-pollination or cross-pollination.
(iv) They cannot produce fruits on their own.

(A) (i) only
(B) (iv) only
(C) (i) and (iii)
(D) (i) and (iv)

Source
CBSE 2025 · 31/1/1 Q10; 31/1/2 Q11; 31/1/3 Q10 [F9 p190, p231, p274]

✓ Answer
(C) (i) and (iii).

A65 **Multiple Choice** · 1 mark ★ Board ×1 1 paper

Which of the following is the correct sequence of parts of female reproductive system of flowering plants in terms of their placement ?

(A) Stigma, ovule, ovary, style
(B) Ovule, stigma, ovary, style
(C) Style, stigma, ovule, ovary
(D) Stigma, style, ovary, ovule

Source
CBSE 2025 · 31/2/3 Q9 [F9 p486]

✓ Answer
(D) Stigma, style, ovary, ovule – the ovule is inside the ovary.

A66 **Multiple Choice** · 1 mark ★ 2 papers

Which among the following statements are true for unisexual flowers?
i. they possess both stamen and pistil
ii. they possess either stamen or pistil
iii. they exhibit cross pollination
iv. unisexual flowers possessing only stamens cannot produce fruits.

a) (i) and (iv)
b) (ii), (iii) and (iv)
c) (iii) and (iv)
d) (i), (iii) and (iv)

Source
Bangalore Sahodaya Pre-board-1 2024-25 – Q10 [F5 p14]
Sample Question Paper-II – Q7 [F5 p239]

✓ Answer
(b) (ii), (iii) and (iv).

A67 **Multiple Choice** · 1 mark ★ 1 paper

The anther contains

(a) Pollen grains.
(b) pistil.
(c) ovules.
(d) sepals.

Source
KVS Pre-board 2022-23 – Q14 [FM p16]

✓ Answer
(a) Pollen grains.

Very Short Answer · 5

A68 **Very Short Answer** · 2 marks ★★★ Board ×7 12 papers

What is pollination? Differentiate between self-pollination and cross-pollination.

Source
CBSE 2025 · 31/1/1, 31/1/2 Q35 OR(b)(i) [F9 p202, p247]
CBSE 2026 · 31/8/1–3 Q16(ii) [F4 p101, p133, p165]
CBSE Supplementary · 31/S/3 Q34(a)(i) (yr?) [F4 p342]
CBSE 2023 · 31/1/1 Q35(b) [F1 p108]
CBSE 2023 · 31/6/3 Q35(a) [F9 OCR p57]
CBSE 2026 VI (LMNK2) – Q16(b)(i) [F1 p67]
CBSE old paper (Series BRH/2, 31/2/1) – Q24(ii) [F5 OCR p49]
KVS Pre-board 2022-23 – Q34 [FM p18]
KVS Lucknow Region Pre-board – Q16 OR [FM p80]
Practice papers – [F6 p306; F6 p415]

✓ Answer
• Pollination: the transfer of pollen grains from the anther (stamen) to the stigma (1).
• Self-pollination – pollen reaches the stigma of the same flower; cross-pollination – pollen is carried from one flower to the stigma of another flower (by wind, water or animals) (1).

⚠ **Note:** This idea is asked inside many 5-mark questions. Learn it well – it is the most repeated point of Part A.

A69 **Very Short Answer** · 2 marks ★ Board ×2 2 papers

Draw a diagram of the longitudinal section of a flower and label Sepal, Petal, Ovary and Stigma.

Source
CBSE 2026 · 31/7/1 Q11 OR(b); 31/7/2 Q11 OR(b) [F4 p37, p52]
CBSE old paper (Series RHB/1, 31/1/1) – Q25(a) [F6 OCR]
Also asked as: RHB/1 (5 marks): "(a) Draw a diagram of the longitudinal section of a flower and label on it sepal, petal, ovary and stigma. (b) Write the names of male and female reproductive parts of a flower." – stamen (male), pistil/carpel (female).

✔ Answer
Longitudinal section of a flower with labels sepal, petal, ovary and stigma (also stamen/anther, style) (2). See "Picture it".

A70 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

(a) Which of the following flowers will have higher possibility of self-pollination ? Mustard, Papaya, Watermelon, Hibiscus
(b) List the two reproductive parts of a bisexual flower.

Source
CBSE 2022 Term-II · 31/1/1 Q3; 31/1/2 Q4 [F9 p168, p213]

✔ Answer
(a) Mustard and Hibiscus – they are bisexual flowers (1).
(b) Stamens (male) and pistil/carpel (female) (1).

A71 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Write one function each of the following, in a seed : (i) Seed coat (ii) Cotyledon (iii) Radicle (iv) Plumule

Source
CBSE 2025 · 31/2/1 Q24(a); 31/2/2 Q24(a); 31/2/3 Q24(a) [F9 p352, p420, p492]
Also asked as: KV Varanasi SA-II Q35: "What is the function of cotyledons in a seed? How is bean seed different from maize seed on the basis of number of cotyledons?" – bean: two cotyledons (dicot); maize: one (monocot) [F5 p281].

✔ Answer
(i) Protects the embryo (½). (ii) Stores food for the embryo (½). (iii) Grows into the root (½). (iv) Grows into the shoot (½).

A72 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Explain giving one example of each, the unisexual and the bisexual flowers.

Source
CBSE old paper (Series RHB/1, 31/1/1) – Q11 [F6 OCR]

✔ Answer
Unisexual flower – has either stamens or carpels, e.g. papaya, watermelon (1).
Bisexual flower – has both stamens and carpels, e.g. Hibiscus, mustard (1).

Short Answer · 4

A73 Short Answer · 3 marks ★ Board ×1 1 paper

(a) How is the process of pollination different from fertilization?
(b) Where is the zygote located in the flower after fertilization?

Source
CBSE 2026 VI (E7FDG) – Q13 [F9 p73]

✔ Answer
(a) Pollination – transfer of pollen from anther to stigma (1); fertilisation – fusion of the male germ cell with the female germ cell (egg) in the ovule (1).
(b) Inside the ovule, in the ovary (1).

A74 Short Answer · 3 marks ★ Board ×1 1 paper

(a) Name a part of the flower which (i) persists even after a fruit is formed, (ii) attracts insects for pollination, (iii) produces pollen grains and (iv) changes into seed after fertilisation.
(b) After pollination, how does a male germ cell reach the ovary? Mention the significance of this event.

Source
CBSE Supplementary · 31/S/1 Q29; 31/S/2 Q31 (yr?) [F4 p201, p313]

✔ Answer
(a) (i) Sepals (calyx – in some fruits) (ii) Petals (iii) Anther (iv) Ovule (½ each).
(b) The pollen grain on the stigma grows a pollen tube through the style to the ovule; the male germ cell travels through it (½). Significance – it fuses with the female germ cell (fertilisation) to form the zygote (½).

A75 Short Answer · 3 marks ★ 2 papers

Bindu wants to produce a hybrid variety of tomatoes (bisexual flowers). She (1) removes a part of the flowers of plant X just before they bloom, (2) pollinates them by hand with pollen from plant Y, and (3) ties small plastic bags around the pollinated flowers.
(a) She carries out step 1 to prevent self-pollination. Which part did she remove? (1)
(b) Why does she cover the pollinated flowers? (1)
(c) For pumpkins, which have unisexual flowers, she does not remove any part but still ties the bags. Why? (1)

Source
CBSE Competency Focused Practice Questions – Q39, Q100 [F6 p33, p56–57; key p35, p68]
CBSE competency item bank – How do Organisms Reproduce? Q7 [F4 p742–743]

✔ Answer
(a) The stamens (anthers) (1).
(b) To prevent pollen from other plants from reaching the stigma (1).
(c) A female pumpkin flower has no stamens, so self-pollination cannot happen; but the bag is still needed to keep out unwanted pollen from other plants (1).

A76 **Short Answer** · 3 marks ★ 1 paper

Compare the reproductive parts of flowers and humans and answer the questions below:
(a) Which part of the human female reproductive system has a similar function as the stigma in a flower? Give a reason to support your answer.
(b) Testes in the male reproductive system would correspond to which part of the male reproductive system in a flower? Justify.
(c) The style of a flower and the fallopian tube in humans correspond functionally with each other. Is this statement true? Justify your answer.

Source
CBSE Competency Focused Practice Questions – Q41 [F6 p34, key p35]

✔ Answer
(a) Cervix / vagina – like the stigma, it is the point of entry for the male gametes (1).
(b) Anther – it produces the male gametes (in pollen), just as testes produce sperms (1).
(c) False – the oviduct is the site of fertilisation; the style only carries the pollen tube to the ovary (1).

Long Answer · 7

A77 **Long Answer** · 5 marks ★★ **Board ×4** 5 papers

(i) In flowering plants, the process of pollination leads to fertilization. Explain with the help of a well-labelled diagram how the male germ cell from the pollen grain reaches the female germ cell located in the ovule.
(ii) Differentiate between self-pollination and cross-pollination.
(iii) Identify and name the parts 'R' and 'S' in the given diagram of seed.

Source
CBSE 2026 · 31/8/1 Q16(A); 31/8/2 Q16(B); 31/8/3 Q16(A) [F4 p101, p133, p165]
CBSE old paper (Series BRH/1, 31/1/1) – Q24 [F5 OCR p9]
CBSE old paper (Series BRH/2, 31/2/1) – Q24(i) [F5 OCR p49]
CBSE old paper (Series BRH, 31/1) – Q24 [F6 OCR]
KVS Raipur Region Pre-board-2 2025-26 – Q34 OR [F5 p302]
Also asked as: BRH/1: "Define the terms pollination and fertilisation. Draw a diagram of a pistil showing pollen tube growth into the ovule and label pollen grain, male gamete, female gamete, ovary." · KVS Raipur: "Why is fertilization not possible without pollination? ... Describe post pollination changes with a neat labelled diagram showing germination of pollen on the stigma."

✔ Answer
(i) Pollen lands on the stigma; a tube grows out of the pollen grain and travels through the style to reach the female germ cell in the ovary (ovule); the male germ cell moves through the tube and fuses with the female germ cell (2). Labelled diagram – pollen grain, stigma, pollen tube, style, ovary, female germ cell (1).
(ii) Self – pollen to the stigma of the same flower; cross – to the stigma of another flower (1).
(iii) Name them from the seed parts: plumule (future shoot), radicle (future root), cotyledon (food store) (1).

⚠ **Note:** The seed figure (R, S) is not readable in our copy of the 2026 paper; see the seed figure in the next question.

A78 **Long Answer** · 5 marks ★ Board ×1 2 papers

(a) Name the two types of pollination and differentiate between them.
(b) Explain the post fertilization changes that occur in the ovary of a flower.
(c) Given below is a diagram of a germinating seed. Label the parts that (i) gives rise to future shoot. (ii) gives rise to future root system. (iii) stores food.

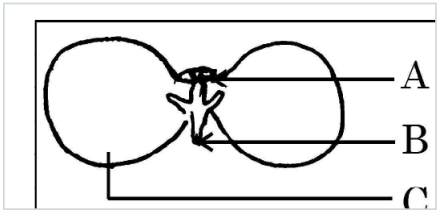


Figure from the question paper (CBSE 2023, 31/6/3)

Source
CBSE 2023 · 31/6/3 Q35 [F9 OCR p57]
Practice papers – Q16 [F6 p259; F6 p291]

✓ Answer
(a) Self-pollination – pollen reaches the stigma of the same flower; cross-pollination – pollen is carried to the stigma of another flower (2).
(b) The zygote divides to form the embryo in the ovule; the ovule becomes the seed; the ovary grows rapidly and ripens to form the fruit (2).
(c) (i) A – plumule (ii) B – radicle (iii) C – cotyledon (1).

A79 **Long Answer** · 5 marks ★ Board ×1 1 paper

(a) Name the parts of a bisexual flower that are not directly involved in reproduction.
(b) Differentiate between self pollination and cross pollination. List any two significance of pollination. What is the fate of ovules and ovary after fertilization in a flower?

Source
CBSE 2023 · 31/1/1 Q35 [F1 p108]

✓ Answer
(a) Sepals and petals (1).
(b) Self – pollen to the stigma of the same flower; cross – to another flower (1). Significance: brings the male germ cell to the female part so fertilisation can take place; cross-pollination gives variation (1). After fertilisation the ovule becomes the seed (1) and the ovary becomes the fruit (1).

A80 **Long Answer** · 5 marks ★ Board ×1 1 paper

(i) Write the function of the following parts of a bisexual flower : (1) stigma (2) pollen tube and (3) anther
(ii) Name the (1) future shoot and (2) future root of a germinating seed.
(iii) Name the parts of the flower that develop into (1) seed and (2) fruit after fertilization.

Source
CBSE VI 31(B)/S (CDBA/S) – Q35(a) (yr?) [F1 p21]

✔ Answer
(i) (1) Stigma – receives the pollen; it is sticky (1). (2) Pollen tube – carries the male germ cell from the pollen grain to the ovule (1). (3) Anther – produces pollen grains (1).
(ii) (1) Plumule (2) Radicle (1).
(iii) (1) Ovule → seed (2) Ovary → fruit (1).

A81 **Long Answer** · 5 marks ★ Board ×1 1 paper

(a) Write one function each of the parts (i) petals (ii) anther (iii) style and (iv) ovary of a bisexual flower.
(b) Give one example each of a unisexual flower and a bisexual flower. Mention the changes which a flower undergoes after fertilization.

Source
CBSE 2025 · 31/6/3 Q35 OR [F4 p25]

✔ Answer
(a) (i) Petals – attract insects for pollination (ii) Anther – produces pollen grains (iii) Style – the pollen tube passes through it to the ovary (iv) Ovary – contains ovules; becomes the fruit (½ each).
(b) Unisexual – papaya/watermelon; bisexual – Hibiscus/mustard (1). After fertilisation: zygote → embryo; ovule → seed; ovary → fruit; petals, sepals, stamens, style and stigma fall off (2).

A82 **Long Answer** · 5 marks ★ Board ×1 1 paper

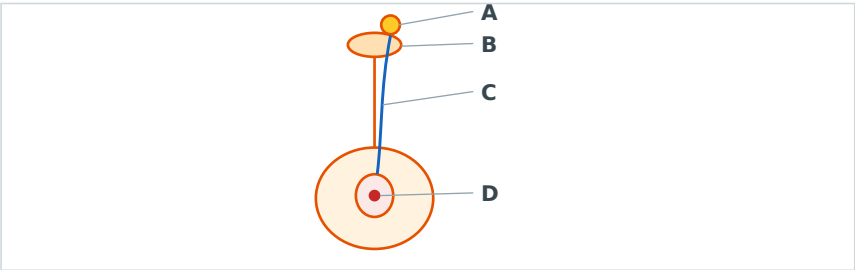
(A) In an angiospermic flower, fertilization is said to take place when male gametes carried in the pollen tube fuse with the female gamete, present in the embryo sac. This results in lot of changes in different parts of the flower. State the changes taking place in the following structures of flower post fertilization (a) Zygote (b) Ovule (c) Ovary (d) Sepals
(ii) Define germination.

Source
CBSE 2026 · 31/5/1 Q16(A); 31/5/2 Q16 OR; 31/5/3 Q16 OR [F4 p470, p503, p534]

✔ Answer
(a) Zygote divides many times to form the embryo (1). (b) Ovule develops a tough coat and becomes the seed (1). (c) Ovary grows rapidly and ripens to form the fruit (1). (d) Sepals (with petals, stamens, style and stigma) shrivel and fall off (1).
(ii) Germination – the seed contains the future plant (embryo), which develops into a seedling under appropriate conditions (1).

A83 **Long Answer** · 5 marks ★ 2 papers

(i) Explain by giving one example of each – unisexual and bisexual flowers.
(ii) Name the labelled parts A, B, C and D in the diagram given below. (germination of pollen on stigma)
(iii) Mention the post-fertilisation changes that occur in (i) Ovary and (ii) Ovule in the flower.



Re-drawn figure (for study) – germination of pollen on stigma

Source
KVS Ahmedabad Region Pre-board 2025-26 – Q16(A) [F9 p507; p519]
Practice paper – Q16 [F6 p356, key p363]

✔ Answer
(i) Unisexual – either stamens or carpels, e.g. papaya/watermelon; bisexual – both, e.g. Hibiscus/mustard (2).
(ii) A – pollen grain, B – stigma, C – pollen tube, D – female germ cell (in the ovary) (2).
(iii) Ovary → fruit; ovule → seed (1).

⚠ **Note:** Labels A–D follow the practice-paper key; the KVS figure is the same NCERT diagram. The practice paper also asks: "Pollination may occur without fertilisation but fertilisation will not take place without pollination. Give reason."

1. Summary table — sub-theme × question type

Sub-theme	MCQ	AR	VSA	SA	LA	Case	Total	Papers	Board
Do organisms create exact copies? (DNA copying and	1	2	1	–	–	–	4	4	0
Fission – Amoeba, Leishmania and Plasmodium	2	1	4	–	1	1	9	19	8
Fragmentation and regeneration	3	1	2	2	1	–	9	10	8
Budding – Hydra and yeast	2	–	3	1	3	–	9	11	8
Vegetative propagation	4	–	4	2	2	1	13	24	16
Spore formation – Rhizopus (bread mould)	1	–	2	1	2	–	6	10	5
Why the sexual mode of reproduction?	1	2	2	2	1	1	9	11	6
Sexual reproduction in flowering plants	8	–	5	4	7	–	24	48	31
Total	**22**	**6**	**23**	**12**	**17**	**3**	**83**	**137**	**82**

2. Top 10 — revise these the night before the exam

Same ranking as the Must-do page.

#	Q no.	Question (short)	Type	Board	Papers	Pag
1	A68	What is pollination? Differentiate between self-pollination and cross-pollination.	VSA	7	12 ★★★	154
2	A36	What is vegetative propagation ? List its two advantages.	VSA	4	6 ★★★	141
3	A77	(i) In flowering plants, the process of pollination leads to fertilization. Explain with the help of a well-labelled diagram how the male germ cell from the pollen grain reache...	LA	4	5 ★★	157
4	A8	Write two differences between binary fission and multiple fission in a tabular form, giving one example of each.	VSA	2	5 ★★	130
5	A9	Name the method by which Amoeba and Leishmania reproduce. Write a major difference in the way they divide to produce new individuals.	VSA	2	3 ★★	130
6	A40	Give reasons for the following : (b) Fertilization cannot take place in flowers if pollination does not occur. (c) All multicellular organisms cannot give rise to ne...	SA	2	3 ★★	142
7	A42	Name the most suitable method of raising a banana plant. Is this mode of reproduction sexual or asexual? List any three advantages of growing plants by such a method.	LA	2	3 ★★	143
8	A60	The part of a seed which is a source of food during its germination is :	MCQ	2	3 ★★	152
9	A14	Spirogyra, despite being a multi-cellular organism, still shows a simple reproductive method. Select the correct option with regard to reproduction in Spirogyra :	MCQ	2	2 ★	133
10	A43	(i) Sugarcane does not produce seeds so name the process through which it will be able to reproduce. (ii) List any two advantages of this method. (iii) Besides sugarcane...	LA	2	2 ★	144

Science with Abhishek Sir

Prepared by Abhishek Das, TGT (Science)

Human Reproduction

Class 10 Science (086) · Chapter 7 How do Organisms Reproduce?
Section 7.3.3 Reproduction in Human Beings · Chapterwise past-paper question bank with answers · 2026-27 syllabus

about 120	59	118	74
papers gone through (62 CBSE board sets)	papers with this topic (23 CBSE board exams)	question appearances found	unique questions after clubbing (+7 NEW)

What I went through

Paper kind	In the collection	Had this topic	Examples
CBSE board papers (main, 2022–2026)	44 sets	14	2023 31/1, 31/5 · 2024 2231/3 · 2025 31/1, 31/2 · 2026 31/2, 31/4, 31/5, 31/7, 31/8
CBSE supplementary + visually impaired	9 sets	3	31/S · 31(B)/S · 31(B) 2026
Old CBSE SA-I / SA-II papers	9 papers	6	Series RSH, RHB, RLH, BRH
CBSE SQP + official item banks	7	13	SQP 2024-25 · CFPQ · SAS items · British Council items
KVS / Sahodaya pre-boards and tests	about 24	15	KVS Lucknow, Varanasi, Raipur, Ahmedabad, (DR) · Sahodaya
Publisher / practice sample papers	about 26	16	practice sets · practice sample papers

In this chapter

Part B cover	p. 162	Concept map	p. 163
Diagram mind map	p. 164	Must-do top 20	p. 165
Changes at puberty	p. 166	Testes and scrotum	p. 169
Path of sperms and the glands	p. 173	Ovary, oviduct and uterus	p. 177
Fertilisation, implantation and placenta	p. 181	Egg not fertilised – menstruation	p. 188
Germ cells and chromosome number	p. 191	Methods of contraception	p. 193
Sexually transmitted diseases	p. 198	Sex ratio and prenatal sex determination	p. 201
Summary	p. 203		

Part A of this chapter starts on page 124. How to read a question box: see page iv at the front of the book.

Concept map — what is asked, and how often

Changes at puberty
7 questions · 7 papers · **2 board**
Most asked (Q6): You must have noticed many dramatic changes in your appearance as well as that of your friends ...

Testes and scrotum
9 questions · 14 papers · **7 board**
Most asked (Q10): Assertion (A): Testes in human males are located outside the abdominal cavity in scrotum.

Path of sperms and the glands
9 questions · 10 papers · **4 board**
Most asked (Q21): List two roles of each of the following in human reproductive system :

Ovary, oviduct and uterus
7 questions · 12 papers · **3 board**
Most asked (Q26): Where does fertilization occur in human females?

Fertilisation, implantation and placenta
15 questions · 20 papers · **4 board**
Most asked (Q39): What is placenta? Explain its function in human beings.

Egg not fertilised - menstruation
6 questions · 6 papers · **3 board**
Most asked (Q51): (a) What happens when in a human female the egg released by the ovary is not fertilised ?

Germ cells and chromosome number
4 questions · 4 papers · **3 board**
Most asked (Q54): A zygote is formed by the fusion of a male gamete and a female gamete. The number of chromosome...

Methods of contraception
13 questions · 17 papers · **4 board**
Most asked (Q65): List and explain in brief three methods of contraception.

Sexually transmitted diseases
7 questions · 16 papers · **9 board**
Most asked (Q76): Write two examples each of sexually transmitted diseases caused by (i) virus, (ii) bacteria. Ex...

Sex ratio and prenatal sex determination
4 questions · 5 papers · **3 board**
Most asked (Q79): Give reasons for the following: Prenatal sex determination is banned in India.

Diagrams to practise (see the diagram mind map on the next page)

Diagram	Labels you must know	Asked in
Human male reproductive system	testis, scrotum, vas deferens, seminal vesicle, prostate gland, urethra, penis, urinary bladder	Draw it (KVS Varanasi 2014-15); identify a part (CBSE competency items; practice papers); roles of each part in 11+ questions
Human female reproductive system	ovary, oviduct (fallopian tube), uterus, cervix, vagina + mark egg made / fertilisation / implantation	Draw and label (old CBSE BRH 31/1, KVS Varanasi 2016-17, KVS Lucknow 2024-25, KVS (DR) 2024-25); identify parts (CFPQ Q103, SAS item, CBSE 2025 31/2 case)
Placenta and the growing foetus	uterine wall, blood spaces, villi, placenta, umbilical cord, foetus	Describe structure (CBSE 2026 31/8, 31/S); picture-based case (CBSE SQP 2024-25)
Flow charts: path of sperms; fertilisation to birth	testis → vas deferens → urethra; zygote → embryo → implantation → placenta → birth	CBSE 2026 31/2 Q16 (pathway of male germ cells); events after fertilisation (5+ papers)

Theme map (NCERT order)

Puberty and the male reproductive system
- Changes at puberty (7)
- Testes and scrotum (9)
- Path of sperms and the glands (9)

Female reproductive system and the growing baby
- Ovary, oviduct and uterus (7)
- Fertilisation, implantation and placenta (15)
- Egg not fertilised - menstruation (6)
- Germ cells and chromosome number (4)

Reproductive health
- Methods of contraception (13)
- Sexually transmitted diseases (7)
- Sex ratio and prenatal sex determination (4)

Diagram mind map — what to revise again and again

★★★ must draw many times · ★★ must know well · draw neat line sketches, labels in NCERT words

DIAGRAMS TO REVISE
Human Reproduction

Female reproductive system ★★★
Draw + label (6+ papers)
ovary · oviduct (fallopian tube)
uterus · cervix · vagina
Mark on it:
where eggs are made (ovary)
where fertilisation happens (oviduct)
where zygote is implanted (uterus)

Male reproductive system ★★
Draw + label; identify a part
testis · scrotum · vas deferens
seminal vesicle · prostate gland
urethra · penis · urinary bladder
Remember:
urethra = sperms + urine
testes outside - lower temperature

Placenta and foetus ★★
Describe / label structure
disc in uterine wall
villi - embryo's side
blood spaces - mother's side
umbilical cord · foetus
Arrows: glucose + O_2 in,
wastes out to mother's blood

Flow chart: sperm path ★★
Write as arrows
testis → vas deferens → urethra
(+ seminal vesicle, prostate fluid)
→ vagina → cervix → uterus
→ oviduct (meets the egg)
Asked: CBSE 2026 31/2 Q16

Fertilisation → birth ★★★
Write as arrows
fertilisation (oviduct) → zygote
→ embryo → implantation (uterus)
→ placenta → ~9 months → birth
Side branch: egg not fertilised
→ lining breaks → menstruation

Also revise from the rest of Chapter 7 (not part of this human-reproduction bank)

- Binary fission - Amoeba
- Binary fission - Leishmania
- Multiple fission - Plasmodium
- Budding - Hydra
- Budding - yeast (slide)
- Spore formation - Rhizopus
- Regeneration - Planaria
- Vegetative propagation - Bryophyllum
- L.S. of a flower
- Pollen germination on stigma
- Seed germination (plumule, radicle)

Must-do top 20 — most repeated questions

#	Q	Question (short)	Type	★	Papers	Board
1	Q76	Write two examples each of sexually transmitted diseases caused by (i) virus, (ii) bacteria. Explain how the transmissio…	SA	★★★	6	4
2	Q39	What is placenta? Explain its function in human beings.	SA	★★	5	1
3	Q79	Give reasons for the following: Prenatal sex determination is banned in India.	VSA	★★	4	2
4	Q65	List and explain in brief three methods of contraception.	SA	★★	4	1
5	Q26	Where does fertilization occur in human females?	MCQ	★★	4	–
6	Q77	What does HIV stand for? Is AIDS an infectious disease? List any four modes of spreading AIDS.	SA	★★	3	2
7	Q10	Assertion (A): Testes in human males are located outside the abdominal cavity in scrotum.	AR	★★	3	1
8	Q33	In human beings, the implantation of fertilised egg takes place in which part of female reproductive system?	MCQ	★★	3	1
9	Q42	State briefly the changes that take place in a fertilised egg till the birth of the child in the human female reproducti…	LA	★★	3	–
10	Q71	Which out of them is STD?	MCQ	★★	3	–
11	Q15	(a) Name the human male reproductive organ that produces sperms and also secretes a hormone. Write the functions of the …	LA	★	2	2
12	Q21	List two roles of each of the following in human reproductive system :	SA	★	2	2
13	Q43	(i) Name the special tissue inside the uterus that provides nutrition to the developing embryo. Describe its structure. …	LA	★	2	2
14	Q68	(i) Name three techniques/devices used by human females to avoid pregnancy. Also mention the side effects of each.	LA	★	2	2
15	Q13	(a) Mention one function each of the following organs in human male reproductive system :	SA	★	2	1
16	Q28	(a) (i) Write the functions of the following parts of human female reproductive system : (I) Ovary (II) Fallopian tube (…	LA	★	2	1
17	Q29	Draw a diagram of human female reproductive system and label the part	LA	★	2	1
18	Q40	Explain the events that take place once a sperm reaches the oviduct till it becomes a foetus. Write the role of placenta…	SA	★	2	1
19	Q51	(a) What happens when in a human female the egg released by the ovary is not fertilised ?	VSA	★	2	1
20	Q54	A zygote is formed by the fusion of a male gamete and a female gamete. The number of chromosomes in the zygote of a huma…	MCQ	★	2	1

Changes at puberty

Puberty and the male reproductive system · 7 questions · 7 papers · 2 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Puberty = general body growth slows down, reproductive tissues begin to mature.
Both: thicker hair in armpits and genital area, oily skin, pimples.
Boys: thick hair on face, voice begins to crack. Girls: breasts grow, menstruation starts.
Hormones: testosterone (testes) in boys, oestrogen (ovaries) in girls.

Multiple Choice · 3

Q1 Multiple Choice · 1 mark ★ Board ×1 1 paper

During adolescence, reproductive phase starts and :

(a) general growth rate begins to slow down
(b) height becomes less
(c) the body weight is reduced
(d) hair growth decreases

Source: CBSE 2023 · 31/4/2 Q9 [F1 p.276]

✓ Answer
(a) general growth rate begins to slow down. At puberty the rate of general body growth slows down and reproductive tissues begin to mature.

Q2 Multiple Choice · 1 mark ★ 1 paper

The secretion of which hormone leads to physical changes in the body when you are 10-12 years of age?

A. Oestrogen from testes and testosterone from ovary.
B. Oestrogen from adrenal gland and testosterone from pituitary gland.
C. Testosterone from thyroid gland and oestrogen from pituitary gland.
D. Testosterone from testes and oestrogen from ovary.

Source: KVS Lucknow Pre-board 2025-26 Q4 [FM p.79]

✓ Answer
D. Testosterone from testes and oestrogen from ovary.

Q3 Multiple Choice · 1 mark ★ 1 paper

(Graph of average height of boys and girls with age.) What does the graph indicate?

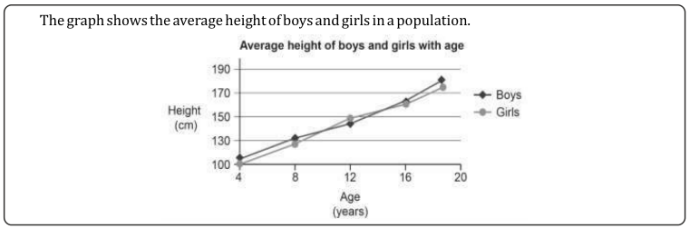


Figure from the question paper

A. The average height of boys is always greater than that of girls.
B. The average height of girls is greater than that of boys in adulthood.
C. The average height of girls during puberty is greater than that of boys.
D. The average heights of girls and boys are the same between 4 and 20 years.

Source: CBSE-SAS Competency Test Items 2021 (Ch 7) Item 6 [F5 p.430]

✔ Answer
C. The average height of girls during puberty is greater than that of boys (key: CBSE item bank, F5 p.484).

Assertion–Reason · 1

Q4 Assertion–Reason · 1 mark ★ Board ×1 1 paper

Assertion (A): In early teenage years, body appearance changes in both boys and girls.
Reason (R): Body undergoes sexual maturity during puberty.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: CBSE 2026 · 31/7/3 Q8 [F4 p.68]

✔ Answer
(A). The changes in appearance are signs of sexual maturation at puberty, so R explains A.

Very Short Answer · 1

Q5 Very Short Answer · 2 marks NEW

List two changes seen in both boys and girls at puberty, and two changes seen only in girls.

Source: NEW – written to fill this sub-theme (not from a past paper).

✔ Answer
Both: thicker hair grows in armpits and genital area; skin becomes oily and pimples may appear (1).
Only in girls: breast size begins to increase and skin of the nipples darkens; girls begin to menstruate (1).

Case / Source-based · 2

Q6 Case / Source-based · 4 marks ★ 2 papers

You must have noticed many dramatic changes in your appearance as well as that of your friends as you approached 10-12 years of age. These changes associated with puberty are because of the secretion of testosterone in males and oestrogen in females. ... As a treatment, they might be taking injections of insulin. This is a hormone that is produced by the pancreas.
(a) Why is the pancreas called a dual gland?
(b) Which hormones bring about the changes of puberty in boys and in girls?
(c) What will happen if the pancreas does not release enough insulin?

Source: Practice sample paper (set 7) Q38 [F4 p.607] | Practice sample paper (F6/F8 copy) Q38 [F6 p.398]

✔ Answer
(b) Testosterone in males and oestrogen in females (1). (a) Pancreas is both an endocrine gland (insulin) and an exocrine gland (digestive juice). (c) Blood sugar level rises – diabetes.

⚠ **Note:** Only part (b) is from this chapter; (a) and (c) belong to Ch 6. The same paper appears again at F6 p.407 and F8 p.7, 16 – counted once.

Q7 Case / Source-based · 4 marks ★ 1 paper

All of us know that our bodies change as we become older. ... But in early teenage years, a whole new set of changes occurs that cannot be explained simply as body enlargement. Instead, the appearance of the body changes. Proportions change, new features appear, and so do new sensations.
(i) In human males, an event that does not reflect the onset of reproductive phase is
(a) growth of body (b) changes in hair pattern (c) change in voice (d) menstruation
(ii) In human males, the testes lie in the scrotum, because it helps in the
(a) process of mating (b) formation of sperm (c) easy transfer of gametes (d) all the above
(iii) Which among the following is the function of testes at puberty?
(a) formation of germ cells (b) secretion of testosterone (c) secretion of estrogen (d) both (a) & (b)
(iv) The correct sequence of organs in the male reproductive system for transport of sperms is ...

Source: KVS Lucknow Pre-board 2023-24 Q39 [FM p.40]

✔ Answer
(i) (a) growth of body – general growth is not a sign of the reproductive phase; hair pattern and voice changes are (menstruation does not happen in males at all). (ii) (b) formation of sperm (iii) (d) both (a) & (b) (iv) testis → vas deferens → urethra.

⚠ **Note:** Options of part (iv) are cut off in the file – screenshot needed.

Testes and scrotum

Puberty and the male reproductive system · 9 questions · 14 papers · 7 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Testes → make sperms + secrete testosterone.
Scrotum keeps testes OUTSIDE the abdominal cavity
because sperm formation needs a LOWER temperature than body temperature.

Multiple Choice · 2

Q8 Multiple Choice · 1 mark ★ 2 papers

In human males, the testes lie in the scrotum, because it helps in

A) process of mating
B) formation of sperm
C) easy transfer of gametes
D) all

Source: KVS (DR) Pre-board-II 2024-25 Q8 [FM p.86] | KVS Lucknow Pre-board 2023-24 Q39(ii) [FM p.40]

✓ Answer
B) formation of sperm – sperm formation requires a lower temperature than the normal body temperature.

Q9 Multiple Choice · 1 mark ★ 1 paper

Which among the following is not the function of testes at puberty?
(i) formation of germ cells (ii) secretion of testosterone (iii) development of placenta (iv) secretion of estrogen

(a) (i) and (ii)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iv)

Source: Sahodaya Pre-board 2024-25 Q10 [F5 p.4]

✓ Answer
(c) (iii) and (iv). Testes form sperms and secrete testosterone; placenta forms in the uterus and oestrogen comes from the ovaries.

Assertion–Reason · 1

Q10 Assertion–Reason · 1 mark ★★ Board ×1 3 papers

Assertion (A): Testes in human males are located outside the abdominal cavity in scrotum.
Reason (R): Scrotum provides a lower temperature than the normal body temperature for sperm formation.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: CBSE 2023 · 31/6/3 Q19 [F9ocr p.49] | KVS Lucknow Pre-board 2024-25 Q19 [FM p.22] | KVS Raipur 2nd Pre-board 2025-26 Q17 [F5 p.323]
Also asked as: • KVS Raipur 2025-26 twist: 'Reason (R): Sperms require temperature HIGHER than the body temperature for development' → answer (C), A true, R false.

✔ Answer
(A) for the CBSE / KVS Lucknow wording. For the 'higher temperature' version the answer is (C).

Very Short Answer · 2

Q11 Very Short Answer · 2 marks ★ Board ×1 1 paper

State the two important roles of male sex hormone – testosterone.
OR
Give two reasons why secretions of prostate gland and seminal vesicles are of significance in human male reproductive system.

Source: CBSE 2026 · 31/8/3 Q12 [F4 p.161]

✔ Answer
Testosterone: (i) regulates formation of sperms (1); (ii) brings about changes in appearance seen in boys at puberty (1).
OR Secretions: (i) make the transport of sperms easier (1); (ii) provide nutrition to the sperms (1).

Q12 Very Short Answer · 2 marks ★ 1 paper

Why are testes placed outside the abdominal cavity in the scrotal sac?

Source: Practice sample paper (F8 p.18) Q22 [F8 p.21]

✔ Answer
Formation of sperms requires a lower temperature than the normal body temperature (1). The scrotum keeps the testes outside the abdominal cavity, where the temperature is lower (1).

Short Answer · 2

Q13 Short Answer · 3 marks ★ Board ×1 2 papers

(a) Mention one function each of the following organs in human male reproductive system :
(i) Testis (ii) Scrotum (iii) Vas deferens (iv) Prostate gland
(b) Name the type of germ cell which (i) is motile, and (ii) stores food.

Source: CBSE 2022 Term-II · 31/1/1 Q10 [F9 p.114] | Practice sample paper (F6 p.329) Q14 [F6 p.331]

✓ Answer
(a) Testis – makes sperms and secretes testosterone; Scrotum – keeps testes outside the abdominal cavity at a lower temperature needed for sperm formation; Vas deferens – carries sperms from testes towards urethra; Prostate gland – adds its secretion so sperms are in a fluid, making transport easier and giving nutrition (1/2 x 4).
(b)(i) Male germ-cell (sperm) (1/2); (ii) Female germ-cell (egg) (1/2).

Q14 Short Answer · 3 marks ★ Board ×1 1 paper

(a) Write one function each of ovary and testis in the human reproductive system.
(b) Give reason why (i) testes are located outside the abdominal cavity. (ii) lining of the uterus becomes thick every month.

Source: CBSE Supplementary · 31/S/2 Q29 [F4 p.259]

✓ Answer
(a) Ovary – produces eggs / secretes hormones (1/2); Testis – produces sperms / secretes testosterone (1/2).
(b)(i) Sperm formation requires a lower temperature than normal body temperature (1).
(ii) To receive and nourish the embryo if fertilisation takes place (1).

Long Answer · 2

Q15 Long Answer · 5 marks ★ Board ×2 2 papers

(a) Name the human male reproductive organ that produces sperms and also secretes a hormone. Write the functions of the secreted hormone.
(b) Name the parts of the human female reproductive system where (i) fertilisation takes place, (ii) implantation of the fertilised egg occurs. Explain how the embryo gets nourishment inside the mother's body.

Source: CBSE SA-II (old) · Series RLH 31/1 Q20 [F9 p.98] | **CBSE VI Supplementary · 31(B)/S (CDBA/S) Q35(b) [F1 p.11]**

✓ Answer
(a) Testis (1/2). Testosterone regulates formation of sperms and brings about changes in appearance in boys at puberty (1+1/2).
(b)(i) Oviduct / fallopian tube (1/2); (ii) uterus – its lining (1/2).
Nourishment: through placenta – a disc embedded in the uterine wall; it has villi on the embryo's side and blood spaces on the mother's side; these give a large surface area for glucose and oxygen to pass from mother to embryo (2).

Q16 Long Answer · 5 marks ★ **Board ×1** 1 paper

(a) (i) Where are testes located in the human males and why ? State two function of the testes.
(ii) In the human female, one of the ovaries releases an egg every month. State the changes that take place if (1) the egg is fertilized, and (2) the egg is not fertilized.
(iii) What is done during the surgical method in males and females to prevent pregnancy ?

Source: CBSE 2023 · 31/5/1, 31/5/2, 31/5/3 Q35(a)/Q34(a) [F1 p.338]

✔ Answer

(i) In the scrotum, outside the abdominal cavity, because sperm formation requires a lower temperature (1). Functions: formation of sperms; secretion of testosterone (1).
(ii)(1) Fertilised egg (zygote) is implanted in the thick lining of the uterus and starts dividing; embryo gets nutrition through placenta and develops into a child (1). (2) Egg lives for about one day; the thick and spongy lining of uterus breaks and comes out through vagina as blood and mucous – menstruation (1).
(iii) Males: vas deferens is blocked (vasectomy) so sperms cannot be transferred; Females: fallopian tube is blocked (tubectomy) so egg cannot reach the uterus (1).

⚠ **Note:** Same question in all three sets (F1 p.338, 362-364, 391) – counted as one appearance.

Science with Abhishek Sir

Path of sperms and the glands

Puberty and the male reproductive system · 9 questions · 10 papers · 4 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Testis –→ Vas deferens –→ Urethra –→ outside
(+ fluid from seminal vesicles and prostate gland)
Urethra = common passage for sperms and urine. Sperm = genetic material + long tail.

Multiple Choice · 2

Q17 Multiple Choice · 1 mark ★ 1 paper

The diagram below represents the male human reproductive system. Identify the part that is responsible for the secretion of testosterone.

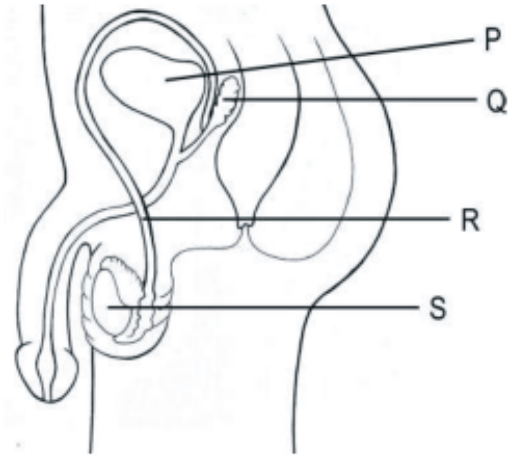


Figure from the question paper

1 P
2 Q
3 R
4 S

Source: CBSE Competency items – How do Organisms Reproduce? Q2 [F4 p.739]

✓ Answer
4 – S, the testis. Testes make sperms and secrete the hormone testosterone (item key: 4).

Q18 Multiple Choice · 1 mark NEW

The correct sequence of organs in the male reproductive system for transport of sperms is :

(a) testis → vas deferens → urethra
(b) testis → ureter → urethra
(c) testis → urethra → ureter
(d) testis → vas deferens → ureter

Source: NEW – written to fill this sub-theme (not from a past paper).

✓ Answer
(a) testis → vas deferens → urethra.

Assertion–Reason · 1

Q19 Assertion–Reason · 1 mark ★ 2 papers

Assertion (A): Urethra in human males acts as a urinogenital canal.
Reason (R): Urethra carries only urine while sperms are carried by vasa deferentia only.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: KVS (DR) Pre-board-II 2024-25 Q19 [FM p.89] | Practice sample paper (F8 p.34) Q18 [F8 p.37]

✓ Answer
(C). A is true – urethra is a common passage for both sperms and urine. R is false – the vas deferens delivers sperms to the urethra, which carries them out.

Very Short Answer · 1

Q20 Very Short Answer · 2 marks ★ 1 paper

a) Trace the path a male gamete takes to fertilize a female gamete after being released from the penis.
b) State the number of sets of chromosomes present in a zygote.

Source: Sahodaya Pre-board 2024-25 Q23 [F5 p.22]

✓ Answer
a) Vagina → cervix → uterus → oviduct (fallopian tube), where it meets the egg (1).
b) Two sets (one from each parent) (1).
→ Diagram to revise – see the diagram mind map (page 3).

Short Answer · 2

Q21 Short Answer · 3 marks ★ Board ×2 2 papers

List two roles of each of the following in human reproductive system :
(i) Seminal vesicles and prostate gland (ii) Oviduct (iii) Testis

Source: CBSE 2024 · 31/4/1 (D4CBA) Q29(b) [F1 p.259] | CBSE VI Supplementary · 31(B)/S (EFGH/S) Q35(a)(i) [F1 p.28]
Also asked as: • List the parts of human male reproductive system which contribute fluid to the semen. State two advantages semen offers to the sperms. (CBSE SA-II old · BRH 31/2/1, F5ocr p.45)
• What is the role of the seminal vesicles and the prostate gland? (KVS Lucknow Pre-board, FM p.57, Q35(a))

✓ Answer
(i) Seminal vesicles and prostate gland: add their secretions so that sperms are in a fluid; this makes their transport easier and provides nutrition (1).
(ii) Oviduct: carries the egg from the ovary to the uterus; site of fertilisation (1).
(iii) Testis: formation of sperms; secretion of testosterone (1).

Q22 Short Answer · 3 marks ★ 1 paper

The sperms are tiny bodies that consist of mainly genetic material and a long tail.
i. Where are the sperms produced and what is the role of the long tail?
ii. How are the sperms delivered from the site of their production?

Source: Practice sample paper (F8 p.99) Q22 [F8 p.102]

✔ Answer
i. In the testes (1/2); the long tail helps them to move towards the female germ-cell (1).
ii. Through the vas deferens, which unites with a tube from the urinary bladder; the urethra is the common passage and carries sperms out. Seminal vesicles and prostate gland add their secretions so that sperms are in a fluid (1+1/2).

Long Answer · 3

Q23 Long Answer · 5 marks ★ **Board ×1** 1 paper

Attempt either (a) or (b):
(a) (i) Name an organ that helps in the formation of male germ cells in humans and also mention the condition that favours the formation of male germ cells.
(ii) In male reproductive system, write the pathway followed to deliver male germ cells to the site of fertilisation.
(iii) Mention the main physical feature of the male germ cell that helps it move towards the female germ cell. 2+2+1=5

Source: CBSE 2026 · 31/2/1, 31/2/2, 31/2/3 (LMNK2) Q16(a)/Q15(a) [F9 p.236]

✔ Answer
(i) Testes (1); sperm formation requires a lower temperature than the normal body temperature – testes lie in the scrotum outside the abdominal cavity (1).
(ii) Testis → vas deferens → urethra → (released into vagina) → cervix → uterus → oviduct, the site of fertilisation (2).
(iii) Long tail (1).
→ Diagram to revise – see the diagram mind map (page 3).

⚠ **Note:** Same in all three sets (F9 p.236, 298, 361). Part (b) of this OR is under Contraception.

Q24 Long Answer · 5 marks ★ **Board ×1** 1 paper

(a) Mention the role of the following organs of human male reproductive system : (i) Testis (ii) Scrotum (iii) Vas-deferens (iv) Seminal vesicle
(b) What is Placenta ? State its function in a human female.

Source: CBSE 2023 · 31/1/3 Q34 [F1 p.91]
Also asked as: • (a) What is puberty? Write any two changes that occur in boys during early teenage years. (b) List two functions performed by testis. Mention one role each of (i) Vas deferens, (ii) Seminal Vesicle (iii) Urethra and (iv) Scrotum. (CBSE 2024 · 2231/3/2 Q35(a), F1 p.201; Practice paper F6 p.331 Q16)
• Describe in brief the role of (i) testis (ii) seminal vesicle (iii) vas deferens (iv) ureter and (v) prostate gland. (CBSE SA-II old · BRH 31/1 Q24 OR, F5ocr p.9)
• State one function of each: (a) Vas deferens (b) Testes (c) Prostate glands. (KVS Ahmedabad Pre-board 2025-26, F9 p.414 Q(B)(ii))

✓ Answer
(a) Testis – formation of sperms and secretion of testosterone; Scrotum – keeps testes outside the abdominal cavity at the lower temperature needed for sperm formation; Vas deferens – carries sperms from testes to the urethra; Seminal vesicle – adds secretion so that sperms are in a fluid: easier transport and nutrition (3).
(b) Placenta is a special tissue, a disc embedded in the uterine wall (1). It passes glucose and oxygen from mother's blood to the embryo and removes the wastes of the embryo into the mother's blood (1).
For the puberty variant: puberty = when general body growth slows and reproductive tissues begin to mature; boys – thick hair on face, voice begins to crack. Urethra = common passage for sperms and urine. For 'ureter': it carries urine from kidney to urinary bladder – it is not a reproductive organ.

Q25 Long Answer · 5 marks ★ 1 paper

Draw the labeled diagram of male reproductive organs of human. Write the functions of prostate gland and seminal vesicles.

Source: KVS Varanasi SA-II 2014-15 Q20 [F5 p.299]

✓ Answer
Diagram with labels: testis, scrotum, vas deferens, seminal vesicle, prostate gland, urethra, penis, urinary bladder (3). Prostate gland and seminal vesicles add their secretions so that sperms are in a fluid; this makes their transport easier and also provides nutrition (2).
→ Diagram to revise – see the diagram mind map (page 3).

Ovary, oviduct and uterus

Female reproductive system and the growing baby · 7 questions · 12 papers · 3 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Ovary (eggs + hormones) –→ Oviduct / fallopian tube (fertilisation) –→ Uterus (implantation, baby grows) –→ Cervix –→ Vagina (sperms enter here). One egg every month by one of the ovaries.

Multiple Choice · 1

Q26 Multiple Choice · 1 mark ★★ 4 papers

Where does fertilization occur in human females?

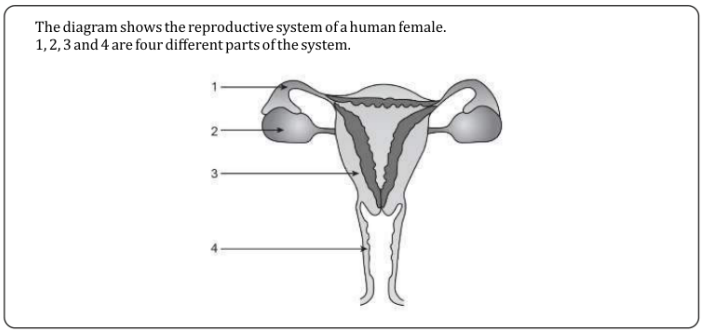


Figure from the question paper

a. Uterus
b. Cervix
c. Oviduct
d. None of these

Source: KVS Lucknow 1st Pre-board Q12 [FM p.54] | Practice sample paper (set 7) Q10 [F4 p.597] | Practice sample paper (F8 p.115) Q10 [F8 p.116] | CBSE-SAS Competency Test Items 2021 Item 8 [F5 p.434]
Also asked as: • In human beings, fertilization of ovum takes place in: (a) Fallopian tubes (b) Ovary (c) Uterus (d) Vagina (practice papers)
• SAS item 8 (figure shown): In which part of the female reproductive system does fertilisation take place? A. 1 B. 2 C. 3 D. 4

✓ Answer
c. Oviduct (fallopian tube). For the SAS figure: A – part 1, the oviduct (2 = ovary, 3 = uterus, 4 = vagina).

Very Short Answer · 1

Q27 Very Short Answer · 2 marks ★ Board ×1 1 paper

Describe the role of fallopian tubes in the female reproductive system.

Source: CBSE SA-I (old) · Series RHB 31/1 Q11 [F6 p.108]

✓ Answer
Egg is carried from the ovary to the womb (uterus) through the thin oviduct or fallopian tube (1). Sperms meet the egg here – fertilisation takes place in the oviduct (1).

Long Answer · 3

Q28 Long Answer · 5 marks ★ Board ×1 2 papers

(a) (i) Write the functions of the following parts of human female reproductive system : (I) Ovary (II) Fallopian tube (III) Uterus
(ii) State briefly two contraceptive methods used by human males.

Source: CBSE 2025 · 31/1/1, 31/1/2, 31/1/3 (1GEFH) Q35(a)/Q36(a) [F9 p.140] | KVS Lucknow Pre-board 2025-26 Q16(A) [FM p.80]
Also asked as: • (i) List two functions each of: (1) oviduct (2) uterus (3) ovary (ii) How does the embryo get nourishment inside the mother's body? (CBSE VI · 11-31(B), F9 p.87)
• (i) Functions of Ovary, Fallopian tube, Uterus (ii) What is menstruation? Why does it occur? (CBSE VI · 31(B), F9 p.54 Q35(b))
• Write two functions each of Ovary, Oviduct, Uterus; describe the structure and function of placenta. (CBSE 2024 · 2231/3/2 Q35 OR, F1 p.201)

✓ Answer
(i) Ovary – produces eggs (female germ-cells) and secretes hormones (1). Fallopian tube – carries egg from ovary to uterus; fertilisation takes place here (1). Uterus – zygote is implanted in its lining; the embryo grows here with the help of placenta (1).
(ii) Condom – a mechanical barrier covering the penis so sperms do not reach the egg (1). Vasectomy – vas deferens is blocked by surgery so sperms cannot be transferred (1).
For the menstruation variant: if the egg is not fertilised, the thick, spongy lining of uterus breaks and comes out through vagina as blood and mucous; it occurs because the lining prepared for an embryo is not needed.

Q29 Long Answer · 5 marks ★ Board ×1 2 papers

Draw a diagram of human female reproductive system and label the part
(i) that produces eggs. (ii) where fusion of egg and sperm takes place. (iii) where zygote is implanted. What happens to human egg when it is not fertilised ?

Source: CBSE SA-II (old) · Series BRH 31/1 Q24 OR [6_merged OCR] | KVS (DR) Pre-board-II 2024-25 Q29 [FM p.90]

✓ Answer
Diagram with labels (3): (i) Ovary (ii) Oviduct / fallopian tube (iii) Uterus. Also label cervix and vagina.
If not fertilised: the egg lives for about one day; the thick and spongy lining of the uterus is not needed, so it slowly breaks and comes out through the vagina as blood and mucous – menstruation (2).
→ Diagram to revise – see the diagram mind map (page 3).

Q30 Long Answer · 5 marks ★ 2 papers

(i) Draw a labelled diagram of a human female reproductive system.
(ii) Explain surgical method of contraception in human males & females. 3+2

Source: KVS Varanasi SA-II 2016-17 Q23 [F5 p.279] | KVS Lucknow 1st Pre-board 2024-25 Q34 OR [FM p.32]

✓ Answer
(i) Labelled diagram – ovary, oviduct (fallopian tube), uterus, cervix, vagina (3).
(ii) Males: a small part of vas deferens is cut / blocked (vasectomy) so sperms cannot be transferred.
Females: fallopian tube is blocked (tubectomy) so the egg cannot reach the uterus (2).
→ Diagram to revise – see the diagram mind map (page 3).

Case / Source-based · 2

Q31 Case / Source-based · 4 marks ★ 1 paper

Vasectomy is a method of contraception in males where the vasa deferentia are tied or sealed so as to prevent sperm from entering the urethra. The diagram below represents the human female reproductive system with some of its parts marked P, Q, R, S, T.
(a) Identify the labelled part that will be operated on for 'tubectomy' in females. State its function.
(b) Kavya says that if part R is removed the female would not be able to produce eggs. Is she correct? Justify.

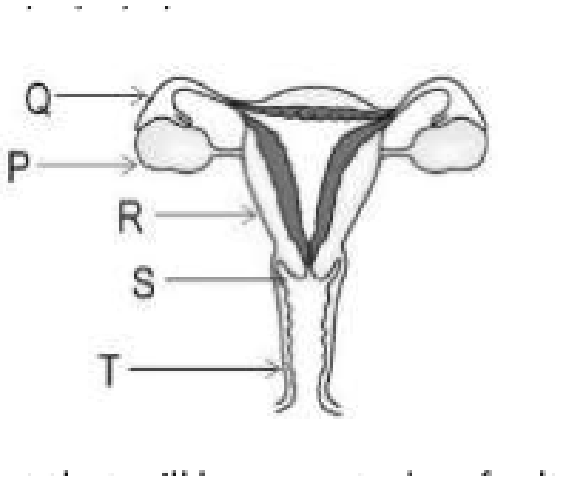


Figure from the question paper

Source: CBSE Competency Focused Practice Questions (CFPQ) Q103 [F6 p.57]

✓ Answer
(a) Q – fallopian tube (1). Function: site where the egg and sperm meet – fertilisation (1).
(b) No (1/2). Eggs are made in the ovaries, which are not removed; R (uterus) does not produce eggs (1+1/2). [Key: CFPQ, F6 p.68-69]
→ Diagram to revise – see the diagram mind map (page 3).

Q32 Case / Source-based · 4 marks ★ 1 paper

Compare the reproductive parts of flowers and humans and answer the questions below:
(a) Which part of the human female reproductive system has a similar function as the stigma in a flower? Give a reason to support your answer.
(b) Testes in the male reproductive system would correspond to which part of the male reproductive system in a flower? Justify.
(c) The style of a flower and the fallopian tube in humans correspond functionally with each other. Is this statement true? Justify your answer.

Source: CBSE Competency Focused Practice Questions (CFPQ) Q41 [F6 p.34]
Also asked as: • Write the names of those parts of a flower which serve the same functions as the following do in animals: testis, sperm, ovary, egg. (Practice paper, F8 p.118 Q22)

✓ Answer
(a) Vagina / cervix – like the stigma, it is where the male gametes enter (1).
(b) Anther – it makes the male gametes (pollen), as testes make sperms (1).
(c) False – fertilisation takes place in the fallopian tube, but not in the style; the style only lets the pollen tube pass (1+1).
Variant: testis – anther; sperm – pollen grain (male germ-cell); ovary – ovary; egg – ovule (female germ-cell).

Science with Abhishek Sir

Fertilisation, implantation and placenta

Female reproductive system and the growing baby · 15 questions · 20 papers · 4 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Sperm meets egg in OVIDUCT → zygote → divides → embryo implanted in UTERUS lining
Placenta: disc in uterine wall, villi on embryo side, blood spaces on mother side
→ glucose + oxygen to embryo, wastes out to mother's blood. About 9 months → birth by rhythmic contraction of uterus muscles.

Multiple Choice · 3

Q33 Multiple Choice · 1 mark ★★ **Board ×1** 3 papers

In human beings, the implantation of fertilised egg takes place in which part of female reproductive system?

(A) Oviduct
(B) Cervix
(C) Uterus
(D) Vagina

Source: CBSE 2026 · 31/5/1, 31/5/2, 31/5/3 Q4 [F4 p.460] | KVS Varanasi SA-II 2016-17 Q2 [F5 p.277] | Practice sample paper (F6 p.282) Q1 [F6 p.282]
Also asked as: • Mention the name of organ situated in female reproductive system where fertilized egg gets implanted. (KVS Varanasi 2016-17)
• Where does the embryo develop in a human female? a) Vagina b) Seminal vesicles c) Fallopian tube d) Uterus (Practice paper Q1)

✓ Answer
(C) Uterus.

Q34 Multiple Choice · 1 mark ★ 1 paper

Which part of the following is a site of implantation?

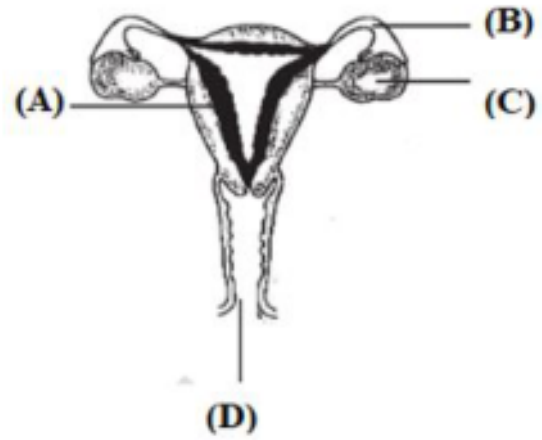


Figure from the question paper

a) D
b) A
c) C
d) B

Source: Practice sample paper (F6 p.282) Q4 [F6 p.282]

✔ Answer
d) B – the uterus. The zygote is implanted in the lining of the uterus. (A and C = ovaries, D = vagina.)

⚠ **Note:** The answer key in the file says (b) A, but in the figure A points to the ovary. The uterus is B, so the correct option is (d).

Q35 Multiple Choice · 1 mark ★ 1 paper

What is the number of sperm(s) that fertilise one egg?

Source: CBSE-SAS Competency Test Items 2021 Item 9 [F5 p.434]

✔ Answer
One (1) sperm fertilises one egg.

Assertion–Reason · 2

Q36 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): Vagina is also called a birth canal.
Reason (R): During birth, the baby passes through the vagina.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: Practice sample paper (F8 p.18) Q18 [F8 p.21]

✓ Answer
(A). The child passes out through the vagina at birth, so it is called the birth canal.

⚠ **Note:** 'Birth canal' is not an NCERT term.

Q37 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): Fusion of gametes gives rise to a single cell called zygote.
Reason (R): Zygote is a fertilised ovum.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: Practice sample paper (F6 p.298) Q8 [F6 p.299]

✓ Answer
(B). Both are true, but R only names the zygote; it does not explain why fusion gives a single cell (key agrees, F6 p.307).

Very Short Answer · 1

Q38 Very Short Answer · 2 marks ★ 1 paper

Mention the events taking place when the ovum is fertilized in fallopian tube till it is implanted in the uterus of human female.

Source: Practice sample paper (F8 p.34) Q22 [F8 p.37]

✓ Answer
The sperm meets the egg in the oviduct and fertilisation forms a zygote (1/2). The zygote starts dividing and forms a ball of cells, the embryo (1/2). The embryo reaches the uterus and is implanted in its thick lining (1).
→ Diagram to revise – see the diagram mind map (page 3).

Short Answer · 3

Q39 Short Answer · 3 marks ★★ Board ×1 5 papers

What is placenta? Explain its function in human beings.

Source: KVS Varanasi SA-II 2016-17 Q13 [F5 p.278] | Practice sample paper (F6 p.268) Q14 [F6 p.270] | **CBSE SA-II (old) · Series BRH 31/1 Q8 [6_merged OCR]** | KVS Raipur 2nd Pre-board 2025-26 Q34(b) [F5 p.325] | KVS Lucknow Pre-board 2022-23 Q34 OR(b) [FM p.18]
Also asked as: • State the role of placenta in the development of embryo. (BRH 31/1 Q8, 2 marks)
• The placenta develops shortly after conception and attaches to the wall of the uterus. What is placenta? Mention its role during pregnancy. (KVS Raipur 2025-26)
• KVS Lucknow 2022-23 Q34 OR: (a) Identify the given diagram. Label any 4 parts from 1 to 5. (b) What is the function of Placenta? (c) Give two changes seen during puberty in male. – the diagram is missing in the paper itself
• Explain how the uterus and placenta provide necessary conditions for proper growth and development of the embryo after implantation. (KVS Lucknow Pre-board, FM p.57)

✓ Answer
Placenta is a special tissue – a disc which is embedded in the uterine wall (1). It contains villi on the embryo's side and blood spaces on the mother's side which surround the villi (1). It provides a large surface area for glucose and oxygen to pass from the mother to the embryo, and the wastes of the embryo are removed into the mother's blood through it (1).

Q40 Short Answer · 3 marks ★ Board ×1 2 papers

Explain the events that take place once a sperm reaches the oviduct till it becomes a foetus. Write the role of placenta in pregnancy.

Source: Practice sample paper (F6 p.329) Q10 [F6 p.330] | **CBSE Supplementary · 31/S/3 Q34(b) [F4 p.342]**
Also asked as: • (i) What is the site of fertilisation of egg in a female reproductive tract? (ii) Fertilised egg on implantation in uterus lining continues to grow and develop to become a foetus. Explain how it gets nourishment and removes metabolic wastes during this period. (CBSE 31/S/3)

✓ Answer
In the oviduct the sperm meets the egg – fertilisation – zygote (1/2). Zygote divides to form embryo, which is implanted in the lining of the uterus and grows and develops organs to become a foetus (1). Placenta: provides a large surface area for glucose and oxygen to pass from mother to embryo (1); wastes of the embryo are removed by transferring them into the mother's blood through the placenta (1/2).
→ Diagram to revise – see the diagram mind map (page 3).

Q41 Short Answer · 3 marks NEW

The placenta is described as a 'disc embedded in the uterine wall'. Explain why the villi make the placenta efficient and what would happen to the embryo if the placenta could not remove wastes.

Source: NEW – written to fill this sub-theme (not from a past paper).

✓ Answer
Villi on the embryo's side, surrounded by blood spaces on the mother's side, provide a large surface area (1) for glucose and oxygen to pass from mother to embryo (1). If wastes of the embryo are not transferred into the mother's blood through the placenta, they would collect and harm the growing embryo (1).

Long Answer · 4

Q42 Long Answer · 5 marks ★★ 3 papers

Describe in short how a fertilised egg develops into a baby inside the human female body. What happens if the egg is not fertilised?

Source: Practice sample paper (set 6) Q30 [F4 p.571] | Practice sample paper (set 2) Q27 [F5 p.342] | Practice sample paper (F6 p.298) Q16 [F6 p.300]
Also asked as: • a. List the sequence of events in the uterus of a human female from fertilisation of egg till childbirth. b. State the changes that are observed in the uterus if fertilisation of egg does not occur. (Practice paper F6 p.300)

✓ Answer
Fertilised egg (zygote) starts dividing (1); it is implanted in the thick lining of the uterus (1); the embryo gets nutrition from mother's blood through the placenta and develops into a child in about nine months (1); the child is born as a result of rhythmic contraction of the muscles in the uterus (1).
Not fertilised: egg lives about one day; the lining of the uterus slowly breaks and comes out through the vagina as blood and mucous – menstruation (1).
→ Diagram to revise – see the diagram mind map (page 3).

Q43 Long Answer · 5 marks ★ Board ×2 2 papers

(i) Name the special tissue inside the uterus that provides nutrition to the developing embryo. Describe its structure. State its two functions besides nutrition.
(ii) Write any two sexually transmitted diseases in humans and their causative microbial agents.

Source: CBSE 2026 · 31/8/1, 31/8/2, 31/8/3 (8DEFG) Q16 OR [F4 p.101] | CBSE Supplementary · 31/S/1, 31/S/2 Q36(b) [F4 p.234]
Also asked as: • (i) Define placenta. State the structure and role of placenta in the development of embryo in human beings. (ii) List three categories of contraceptives and give one example of each. (CBSE 31/S/1-2 Q36(b), F4 p.234, 290)

✓ Answer
(i) Placenta (1/2). Structure: a disc embedded in the uterine wall with villi on the embryo's side and blood spaces on the mother's side that surround the villi (1). Besides nutrition: passes oxygen from mother to embryo; removes wastes of the embryo into the mother's blood (1+1/2).
(ii) Gonorrhoea, syphilis – bacteria; warts, HIV-AIDS – virus (any two with agent) (2).
31/S variant (ii): mechanical barrier – condom; chemical / hormonal – oral pills; loop – Copper-T; surgical – vasectomy / tubectomy (any three).

Q44 Long Answer · 5 marks ★ 1 paper

The figure given below represents the early stages in the development of a female embryo.
i) Name processes R and T.
ii) Describe the genetic makeup (including sex chromosome) of P and Q.
iii) Explain the changes in the uterus both prior and post implantation till childbirth.

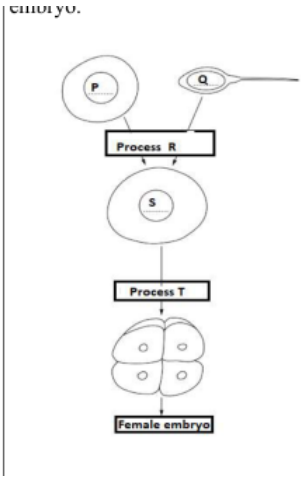


Figure from the question paper

Source: Sahodaya Pre-board 2023-24 (Set 1) Q35 [F5 p.542]

✓ Answer
i) R – fertilisation; T – cell division of zygote (1).
ii) P – egg: 22 + X; Q – sperm: 22 + X (for a female child) (1).
iii) Before implantation the uterus lining becomes thick and richly supplied with blood; after implantation the placenta develops – villi on embryo side, blood spaces on mother side – for glucose, oxygen and wastes; development takes about nine months; child is born by rhythmic contraction of muscles in the uterus (2+1/2). [Key F5 p.518]

Q45 Long Answer · 5 marks ★ 1 paper

Given below are certain situations. Analyze and describe its possible impact on a person:
a) Fallopian tube of a female is blocked.
b) Vas deferens of a man is blocked.
c) Prostate and seminal vesicles are not functional.
d) Egg is not fertilised in a human female.
e) Placenta does not attach to the uterus optimally.

Source: KVS Lucknow 1st Pre-board 2024-25 Q34 [FM p.32]
Also asked as: • What will happen if the fallopian tubes are partially blocked and the ovulated eggs are prevented from reaching the uterus? (Practice paper, F6 p.379 Q22)

✓ Answer
a) Egg cannot reach the uterus and sperms cannot reach the egg – no fertilisation (tubectomy) (1).
b) Sperms cannot be transferred – no fertilisation (vasectomy); testosterone is still made (1).
c) Sperms will not be in a fluid – their transport becomes difficult and they get no nutrition (1).
d) Lining of uterus breaks and comes out as blood and mucous – menstruation (1).
e) Less glucose and oxygen reach the embryo and wastes are not removed well – growth of embryo is affected (1).

Case / Source-based · 2

Q46 Case / Source-based · 4 marks ★ 1 paper

The developing human embryo gets nutrition from the mother through a special tissue called placenta.
(a) Mention TWO structural designs of the placenta that help the embryo to get nutrition.
(b) Is the placental tissue designed for one way transport? Justify your answer.

Source: CBSE Competency items – Life Processes Q20 [F4 p.725]

✓ Answer
(a) It has villi on the embryo's side; it has blood spaces on the mother's side (1 each).
(b) No – glucose and oxygen pass from mother to embryo, and waste made by the embryo is passed out to the mother's blood through the same tissue (1). [Key F4 p.730]
→ Diagram to revise – see the diagram mind map (page 3).

Q47 Case / Source-based · 4 marks ★ 1 paper

The image below shows a developing fetus in the mother's womb. The developing fetus is connected to the placenta by means of umbilical cord. The umbilical vein and artery run inside the umbilical cord.
(i) Name two substances that move through the blood vessels. (1)
(ii) If the placenta has less villi how will it affect the baby's growth? (1)
(iii) Name the region where the embryo develops inside the female body. Explain how this region is adapted for nourishing the baby. (1)
(iv) Some of the fetal cells fall off into the amniotic fluid ... were found to contain XY chromosome. a) What is the sex of the foetus? b) How is this prenatal sex determination misused? (2)

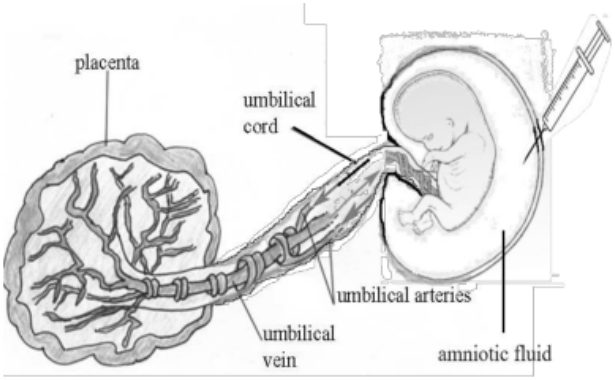


Figure from the question paper

Source: CBSE Sample Question Paper 2024-25 Q36 OR(B) [F6 p.354]

✓ Answer
(i) Glucose / oxygen / nutrients / wastes (any two) (1).
(ii) Less surface area for glucose and oxygen to pass from mother to embryo – slow growth (1).
(iii) Uterus; its lining becomes thick and richly supplied with blood to nourish the embryo (1).
(iv) a) Male (1/2). b) If the foetus is female, some people get it removed – female foeticide (1+1/2). [Key: SQP 2024-25 MS, F6 p.370]
→ Diagram to revise – see the diagram mind map (page 3).

Egg not fertilised - menstruation

Female reproductive system and the growing baby · 6 questions · 6 papers · 3 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Every month uterus lining becomes thick and spongy (to nourish an embryo).
Egg not fertilised → egg lives about one day → lining breaks → comes out through vagina as blood and mucous
= MENSTRUATION (about 2 to 8 days, every month).

Multiple Choice · 1

Q48 Multiple Choice · 1 mark NEW

If the egg is not fertilised, it lives for about :

(a) one hour
(b) one day
(c) one week
(d) one month

Source: NEW – written to fill this sub-theme (not from a past paper).

✔ Answer
(b) one day.

Assertion–Reason · 2

Q49 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): Each month the lining of the uterus thickens to receive a fertilised egg.
Reason (R): One egg is released from an ovary every month.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: Practice sample paper (set 2) Q19 [F5 p.340]

✔ Answer
(A). NCERT: since the ovary releases one egg every month, the uterus also prepares itself every month to receive and nurture the fertilised egg.

Q50 Assertion–Reason · 1 mark ★ 1 paper

Assertion: Uterine wall called endometrium breaks down and bleeding occurs in [menstruation].
Reason: It takes place due to non-fertilization of the ovum.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: KVS Lucknow Pre-board-I 2023-24 Q20 [F5 p.273]

✔ Answer
(A). When the egg is not fertilised, the thick lining of the uterus breaks and comes out as blood and mucous – menstruation.

⚠ **Note:** Same paper also at FM p.43 – counted once. The word 'endometrium' is not used in NCERT (NCERT says 'lining of the uterus'). Last word of A is cut in the file.

Very Short Answer · 1

Q51 Very Short Answer · 2 marks ★ **Board ×1** 2 papers

(a) What happens when in a human female the egg released by the ovary is not fertilised ?
(b) Name one bacterial and one viral infection caused due to unsafe sex.

Source: CBSE 2022 Term-II · 31/1/3 Q4 [F9 p.188] | Practice sample paper (F6 p.253) Q10 [F6 p.254]

✔ Answer
(a) The egg lives for about one day; the thick and spongy lining of the uterus slowly breaks and comes out through the vagina as blood and mucous – menstruation (1).
(b) Bacterial – gonorrhoea / syphilis; viral – warts / HIV-AIDS (1/2 + 1/2).

Long Answer · 1

Q52 Long Answer · 5 marks ★ **Board ×1** 1 paper

(a) What happens when the egg is not fertilised ?
(b) How is sperm genetically different from a human egg / ova ?
(c) List any three contraceptive methods practised for family planning. Mention how these methods work.

Source: CBSE 2023 · 31/1/2 Q35 [F1 p.75]
Also asked as: • (a) Why does menstruation occur? (b) Sexual act always has the potential to result in pregnancy. What are the various ways to avoid pregnancy? Elaborate on any one method. (Practice sample paper, set 6, F4 p.573 Q35)

✔ Answer
(a) Egg lives about one day; lining of uterus breaks and comes out through vagina as blood and mucous – menstruation (1+1/2).
(b) A sperm may carry an X or a Y sex chromosome; every egg carries only an X chromosome (1).
(c) Mechanical barrier – condom, stops sperms reaching the egg; oral pills – change hormonal balance so eggs are not released; loop / Copper-T in the uterus – prevents pregnancy; surgery – vas deferens or fallopian tube blocked (any three) (2+1/2).

Case / Source-based · 1

Q53 Case / Source-based · 4 marks ★ Board ×1 1 paper

When a girl is born, the ovaries already contain thousands of immature eggs. On reaching puberty, some of these start maturing. One matured egg is released every month by one of the ovaries. The two oviducts unite into an elastic bag-like structure known as uterus.
(a) Write the site of fertilization in human female. 1
(b) How does the uterus prepare itself to receive and nurture the growing embryo ? Explain. 1
(c) (i) What happens when the egg is not fertilized ? 2
OR (c) (ii) How does the developing embryo get nutrition from the mother's blood ? Explain. 2

Source: CBSE 2025 · 31/2/1, 31/2/2, 31/2/3 (GHF2E) Q38/Q37 [F9 p.284]

✔ Answer
(a) Oviduct / fallopian tube (1).
(b) Its lining becomes thick and spongy and is richly supplied with blood to nourish the embryo (1).
(c)(i) Egg lives about one day; the lining breaks and comes out through the vagina as blood and mucous; this happens every month – menstruation, lasting about 2 to 8 days (2).
OR (c)(ii) Through placenta – a disc in the uterine wall with villi on embryo's side and blood spaces on mother's side; large surface area for glucose and oxygen to pass to the embryo (2).

⚠ **Note:** Same case in all three sets (F9 p.284, 347, 405).

Germ cells and chromosome number

Female reproductive system and the growing baby · 4 questions · 4 papers · 3 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Body cell: 46 chromosomes (23 pairs). Germ cell (sperm / egg): 23 = half.
Sperm + egg → zygote with 46 again. Halving happens in testes and ovaries.

Multiple Choice · 3

Q54 Multiple Choice · 1 mark ★ Board ×1 2 papers

A zygote is formed by the fusion of a male gamete and a female gamete. The number of chromosomes in the zygote of a human is :

(A) 23
(B) 44
(C) 46
(D) 92

Source: CBSE 2024 · 31/4/1 (D4CBA) Q10 [F1 p.251] | Practice sample paper (F6 p.268) Q2 [F6 p.268]

✔ Answer
(C) 46 – each gamete brings 23 chromosomes.

Q55 Multiple Choice · 1 mark ★ Board ×1 1 paper

The number of chromosomes in a cell division is halved. This kind of cell division is observed in :

(A) Only testis
(B) Only ovary
(C) Ovary and testis both
(D) All cells of the body

Source: CBSE 2025 · 31/2/1, 31/2/2, 31/2/3 (GHF2E) Q10/Q7 [F9 p.264]

✔ Answer
(C) Ovary and testis both – germ cells (eggs and sperms) with half the chromosomes are made there.

Q56 Multiple Choice · 1 mark NEW

Which of the following is correct about human germ cells?

(a) Sperm and egg each have 46 chromosomes
(b) Sperm is motile; egg stores food
(c) Egg is motile; sperm stores food
(d) Both are made in the uterus

Source: NEW – written to fill this sub-theme (not from a past paper).

✔ Answer
(b) Sperm is motile; egg stores food.

Very Short Answer · 1

Q57 Very Short Answer · 2 marks ★ Board ×1 1 paper

State one genetically different feature between sperms and eggs of humans. What is its consequence ?

Source: CBSE SA-II (old) · Series BRH 31/1 Q7 [F5ocr p.5]

✔ Answer

All eggs carry an X chromosome, while half the sperms carry X and half carry Y (1). So the sex of the child is decided by the sperm that fertilises the egg (1).

Methods of contraception

Reproductive health · 13 questions · 17 papers · 4 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Mechanical barrier (condom) | Oral pills (change hormonal balance) | Loop / Copper-T in uterus | Surgery
Vasectomy = vas deferens blocked (male). Tubectomy = fallopian tube blocked (female).
Only the condom also protects from sexually transmitted diseases.

Multiple Choice · 3

Q58 Multiple Choice · 1 mark ★ 1 paper

Which of the following pairs are surgical methods of preventing pregnancy?

(a) vasectomy and copper-T
(b) loop and tubectomy
(c) vasectomy and tubectomy
(d) tubectomy and condom

Source: Practice sample paper (set 6) Q15 [F4 p.566]

✔ Answer
(c) Vasectomy and tubectomy.

Q59 Multiple Choice · 1 mark ★ 1 paper

The diagram below represents a certain contraceptive procedure in human females. This could result in which of the following?

hich of the following?

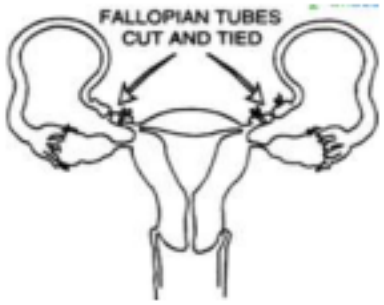


Figure from the question paper

a) Menstrual cycle stops.
b) Ovulation will not occur.
c) Fertilisation cannot take place.
d) Hormonal imbalance is created

Source: Sahodaya Pre-board 2023-24 (Set 1) Q10 [F5 p.529]

✔ Answer
c) Fertilisation cannot take place. The figure shows the fallopian tubes cut and tied (tubectomy), so the egg and sperm cannot meet. Eggs are still released and menstruation continues.

Q60 Multiple Choice · 1 mark ★ 1 paper

Contraceptives help in preventing pregnancies. What function would a contraceptive loop inserted at T serve?

▣ Figure from the question paper — Diagram of female reproductive system with a part marked T
(picture not in the text layer; screenshot requested: F6 p.33)

A. Stopping sperms from reaching and fertilizing eggs
B. Stopping release of sperms
C. Blocking the release of eggs
D. Stopping egg creation

Source: CBSE Competency Focused Practice Questions (CFPQ) Q38 [F6 p.33]

✔ Answer
A. Stopping sperms from reaching and fertilizing eggs.

⚠ **Note:** The figure with part T is not in the screenshot received – the question can still be answered from the options.

Assertion–Reason · 2

Q61 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): Oral contraceptive pills and copper-T do not prevent sexually transmitted diseases.
Reason (R): Sexually transmitted disease are transmitted by contact with mucous membranes of infected organs.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: CBSE Competency items – How do Organisms Reproduce? Q1 [F4 p.739]

✔ Answer
(A) (item key, F4 p.742). Pills and Copper-T do not make a barrier, so contact during the sexual act still spreads the infection.

Q62 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): Surgical methods are most effective methods of contraception.
Reason (R): Surgical method blocks gametes transport and hence prevent fertilization.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: KVS Lucknow Pre-board 2022-23 Q19 [FM p.17]

✔ Answer
(A). Blocking the vas deferens or fallopian tube stops the gametes from meeting.

Very Short Answer · 2

Q63 Very Short Answer · 2 marks ★ 1 paper

Which contraceptive method protects against sexually transmitted infections?

Source: CBSE-British Council assessment items (Science 10) 1(c) [F5 p.196] | CBSE-British Council assessment items (Science 10) 1(a) [F5 p.214]
Also asked as: • Some methods of birth control are 1. ... 2. ... 3. Inter-Uterine Device 4. Oral pill. Which methods limit the spread of sexually transmitted diseases? A. 1 and 2 only B. 2 and 3 only C. 2 and 4 only D. 3 and 4 only (items 1 and 2 are cut in the file – screenshot needed)

✔ Answer
Condom (mechanical barrier / covering) – it stops contact during the sexual act, so it also reduces the spread of sexually transmitted diseases.

⚠ **Note:** Both items are from one item bank – counted as one paper.

Q64 Very Short Answer · 2 marks ★ 1 paper

Suggest any two contraceptive methods to control the size of human population and explain them.

Source: Practice sample paper (F6 p.298) Q10 [F6 p.299]

✔ Answer
Condom – mechanical barrier so sperms do not reach the egg (1). Oral pills – change the hormonal balance of the body so that eggs are not released (1). (Or Copper-T / surgery.)

Short Answer · 3

Q65 Short Answer · 3 marks ★★ Board ×1 4 papers

List and explain in brief three methods of contraception.

Source: CBSE SA-II (old) · Series BRH 31/1 Q16 [6_merged OCR] | KVS Varanasi SA-II 2014-15 Q14 [F5 p.298] | KVS Raipur 2nd Pre-board 2025-26 Q34(a) [F5 p.324] | Practice sample paper (F6 p.313) Q16(a) [F6 p.315]
Also asked as: • Explain with examples the three methods of contraception. (KVS Varanasi 2014-15)
• Suggest three contraceptive methods that can be practiced to control the size of human population ... State the basic principle involved in each. (KVS Raipur 2025-26)
• List three different categories of contraception methods. (Practice paper)

✔ Answer
(i) Mechanical barrier – condom on the penis or similar covering in the vagina; sperms do not reach the egg (1).
(ii) Changing hormonal balance – drugs taken orally (oral pills) so that eggs are not released (1).
(iii) Loop or Copper-T placed in the uterus to prevent pregnancy; OR surgical – vas deferens or fallopian tube blocked so gametes cannot meet (1).

Q66 Short Answer · 3 marks ★ 2 papers

a. Explain the surgical method of contraception used by (i) males, and (ii) females to prevent fertilisation.
b. Write the role of oral pills taken by women as a contraceptive.

Source: Practice sample paper (F6 p.313) Q14 [F6 p.315] | Practice sample paper (F6 p.268) Q16 [F6 p.270]
Also asked as: • i. Use of a condom is beneficial for both the sexes involved in a sexual act. Justify this statement giving two reasons. ii. How do oral contraceptives help in avoiding pregnancies? iii. What is sex selective abortion? How does it affect a healthy society? (Practice paper F6 p.270 Q16)

✓ Answer
a. (i) Vasectomy – vas deferens is blocked so sperms cannot be transferred (1). (ii) Tubectomy – fallopian tube is blocked so the egg cannot reach the uterus (1).
b. Oral pills change the hormonal balance of the body so that eggs are not released (1).
Condom variant: prevents pregnancy and also prevents the spread of sexually transmitted diseases to either partner.

Q67 Short Answer · 3 marks ★ 1 paper

List three techniques that have been developed to prevent pregnancy. Which one of these techniques is not meant for males? How does the use of these techniques have a direct impact on the health and prosperity of a family?

Source: KVS Lucknow Pre-board Q29 [FM p.49]

✓ Answer
Condom, oral pills, Copper-T (or surgery) (1). Oral pills / Copper-T are not meant for males (1). Fewer, well-spaced children keep the mother's health good and the family can give each child better food, health and education (1).

⚠ **Note:** NCERT Exercise Q9 type.

Long Answer · 3

Q68 Long Answer · 5 marks ★ **Board ×2** 2 papers

(i) Name three techniques/devices used by human females to avoid pregnancy. Also mention the side effects of each.

Source: CBSE VI Supplementary · 31(B)/S (EFGH/S) Q35(b)(ii) [F1 p.28] | CBSE 2024 · 2231/3/3 (DAA1B) Q35(c) [F1 p.217]
Also asked as: • (a) Name any two sexually transmitted diseases. (b) Prenatal sex determination is prohibited by law. Why? (c) Name any three methods of contraception stating one side-effect of each. (CBSE 2024 · 2231/3/3 Q35, F1 p.217)

✓ Answer
Oral pills – change the hormonal balance; can cause side effects (1+1/2). Loop / Copper-T in uterus – can cause side effects due to irritation of the uterus (1+1/2). Surgery (tubectomy, fallopian tube blocked) – can lead to infection and other problems if not done properly (1+1/2). [3 marks share of a 5-mark question]

Q69 Long Answer · 5 marks ★ **Board ×1** 1 paper

Radha has three children. She does not want to have more children. Radha visits a nearby hospital, to know the methods to prevent pregnancy.
(i) Mention the name of any two ways other than the surgical methods, following which Radha can avoid unwanted pregnancy.
(ii) Name the surgical methods to prevent pregnancy.
(iii) Give one example each of sexually transmitted diseases caused by bacteria and virus. 2+2+1=5

Source: CBSE 2026 · 31/2/1, 31/2/2, 31/2/3 (LMNK2) Q16(b)/Q15(b) [F9 p.238]

✔ Answer
(i) Oral pills; Copper-T / loop in the uterus (or condom used by partner) (2).
(ii) Tubectomy – fallopian tube blocked; vasectomy – vas deferens blocked (2).
(iii) Bacteria – gonorrhoea / syphilis; virus – warts / HIV-AIDS (1).

Q70 Long Answer · 5 marks ★ 1 paper

a. Name any two bacterial infections that are sexually transmitted. How can they be prevented?
b. List three different ways, other than the one stated in (a) above, that help an individual to avoid unwanted pregnancy.
c. List three advantages for adopting contraceptive measures.

Source: Practice sample paper (F6 p.221) Q16 [F6 p.223]

✔ Answer
a. Gonorrhoea, syphilis; using a covering called condom for the penis during the sexual act (2).
b. Oral pills; loop or Copper-T; surgery – vas deferens or fallopian tube blocked (1+1/2).
c. Mother's health is not badly affected; gap between children; fewer children – better care; prevents some sexually transmitted diseases (any three) (1+1/2).

⚠ **Note:** Same paper repeated at F6 p.239 – counted once.

Sexually transmitted diseases

Reproductive health · 7 questions · 16 papers · 9 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Bacterial: gonorrhoea, syphilis. Viral: warts, HIV-AIDS.
Spread by sexual act. Condom (covering for the penis) helps prevent them.

Multiple Choice · 3

Q71 Multiple Choice · 1 mark ★★ 3 papers

Which out of them is STD?

A) Kala azar
B) jaundice
C) cholera
D) syphilis

Source: KVS (DR) Pre-board-II 2024-25 Q10 [FM p.87] | CBSE-SAS Competency Test Items 2021 Item 10 [F5 p.434] | Practice sample paper (F8 p.99) Q10 [F8 p.100]
Also asked as: • Which of the following diseases is caused by a sexually transmissible bacterium? A. Wart B. Cholera C. Influenza D. Gonorrhoea (SAS item 10; key D)
• Syphilis is caused by (a) Mosquito (b) Virus (c) Parasite (d) Bacteria (practice paper; key (d))

✓ Answer
D) Syphilis.

Q72 Multiple Choice · 1 mark ★ Board ×1 1 paper

The bacterial and the viral infections that may be caused due to unsafe sex respectively are :

(a) Warts and HIV-AIDS
(b) HIV-AIDS and Warts
(c) Gonorrhoea and Syphilis
(d) Syphilis and Warts

Source: CBSE 2023 · 31/5/1, 31/5/2, 31/5/3 (Z1XYW) Q12/Q8/Q10 [F1 p.324]

✓ Answer
(d) Syphilis (bacterial) and Warts (viral).

Q73 Multiple Choice · 1 mark ★ Board ×1 1 paper

From the following, identify the sexually transmitted diseases caused by bacteria.
(i) Warts (ii) Gonorrhoea (iii) AIDS (iv) Syphilis

(A) (iii) and (iv)
(B) (i) and (iii)
(C) (i) and (ii)
(D) (ii) and (iv)

Source: CBSE 2026 · 31/7/1, 31/7/2, 31/7/3 (E7FDG) Sec A MCQ (no. varies by set) [F4 p.35]

✓ Answer
(D) (ii) and (iv) – gonorrhoea and syphilis.

⚠ **Note:** Same MCQ in all three sets (F4 p.35, 50, 64).

Very Short Answer · 2

Q74 Very Short Answer · 2 marks ★ Board ×1 2 papers

Name any two STDs.

Source: KV Sitapur test Q8 [FM p.11] | **CBSE 2024 · 2231/3/3 (DAA1B) Q35(a) [F1 p.217]**

✔ Answer
Gonorrhoea, syphilis (bacterial); warts, HIV-AIDS (viral) – any two.

Q75 Very Short Answer · 2 marks ★ 1 paper

Write the full form of following abbreviations – (i) STD (ii) IUCD (iii) HIV

Source: KVS Varanasi SA-II 2016-17 Q14 [F5 p.278]

✔ Answer
(i) Sexually Transmitted Disease (ii) Intra-Uterine Contraceptive Device (iii) Human Immunodeficiency Virus.

⚠ **Note:** IUCD is not written in full in NCERT.

Short Answer · 2

Q76 Short Answer · 3 marks ★★★ Board ×4 6 papers

Write two examples each of sexually transmitted diseases caused by (i) virus, (ii) bacteria. Explain how the transmission of such diseases be prevented ?

Source: CBSE SA-II (old) · Series RSH/1 Q13 [6_merged OCR] | **CBSE SA (old) · Series RHB/1 Q19 [6_merged OCR]** | **CBSE SA-II (old) · Series BRH 31/1 Q16 [F5ocr p.6]** | KVS Lucknow Pre-board 2022-23 Q23 OR [FM p.17] | KVS Lucknow Pre-board 2025-26 Q16(A) [FM p.73] | **CBSE VI 2026 · 31(B) (E7FDG) Q16(b) [F9 p.14]**
Also asked as: • Explain the meaning of sexually transmitted diseases (STDs). Give two examples of STDs each, caused due to (i) bacterial infection and (ii) viral infection. State in brief how the spread of such diseases may be prevented. (BRH 31/1)
• Ramesh was reading about sexually transmitted diseases... (i) Name two caused by bacteria and two by virus (ii) Mention three preventive measures given in your textbook. (KVS Lucknow 2025-26)
• What are sexually transmitted diseases? Name one caused by virus and a bacterium. List any two contraceptive methods with their advantages. (CBSE VI 2026)

✔ Answer
Diseases spread by sexual act (1/2). Virus: warts, HIV-AIDS (1). Bacteria: gonorrhoea, syphilis (1). Prevention: using a covering called condom for the penis during the sexual act; avoiding unsafe sexual contact (1/2).

Q77 Short Answer · 3 marks ★★ **Board ×2** 3 papers

What does HIV stand for? Is AIDS an infectious disease? List any four modes of spreading AIDS.

Source: CBSE SA-I (old) · Series RHB 31/1 Q19 [F6 p.109] | **CBSE SA-II (old) · Series BRH 31/2/1 Q16 [F5ocr p.47]** | KVS Lucknow Pre-board 2025-26 Q16(B) [FM p.73]
Also asked as: • What is AIDS? Which microbe is responsible for AIDS infection? State one mode of transmission of this disease. Explain in brief one measure for the prevention of AIDS. (BRH 31/2/1)
• (i) List any three ways by which sexually transmitted diseases can spread. (ii) Explain how an infected mother can transmit HIV to her child. (KVS Lucknow 2025-26 Q16(B))

✓ Answer
HIV – Human Immunodeficiency Virus (1/2). Yes, AIDS is an infectious disease caused by a virus (1/2). Modes: unsafe sexual contact; sharing of used needles / syringes; transfusion of infected blood; from infected mother to baby (2).

⚠ **Note:** Modes of spread beyond the sexual act are not in the NCERT text; answer from general science.

Sex ratio and prenatal sex determination

Reproductive health · 4 questions · 5 papers · 3 board exams

Science with Abhishek Sir
Prepared by Abhishek Das, TGT (Science)

Picture it
Surgery can be misused to remove a female foetus → female foeticide
→ female : male child sex ratio falls. Prenatal sex determination is prohibited by law.
A healthy society needs a balanced sex ratio.

Assertion–Reason · 1

Q78 Assertion–Reason · 1 mark NEW

Assertion (A): Prenatal sex determination has been prohibited by law.
Reason (R): Female foeticide is reducing the female-male child sex ratio in some sections of society.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

Source: NEW – written to fill this sub-theme (not from a past paper).

✓ Answer
(A). The law was made to stop sex-selective abortion of female foetuses.

Very Short Answer · 1

Q79 Very Short Answer · 2 marks ★★ Board ×2 4 papers

Give reasons for the following: Prenatal sex determination is banned in India.

Source: CBSE 2026 · 31/4/1, 31/4/3 Q13(b)/Q14(b) [F4 p.371] | CBSE 2024 · 2231/3/3 (DAA1B) Q35(b) [F1 p.217] | Practice sample paper (F6 p.313) Q16(b) [F6 p.315] | CBSE Sample Question Paper 2024-25 Q36 OR(B)(iv) [F6 p.355]
Also asked as: • Prenatal sex determination is prohibited by law. Why? (CBSE 2024)
• Why has Government of India prohibited prenatal sex determination by law? State its benefits in the long run. (Practice paper)
• How is this prenatal sex determination misused? (CBSE SQP 2024-25 case)

✓ Answer
Surgery for removing unwanted pregnancies is misused by people who do not want a child of a particular sex – illegal sex-selective abortion of female foetuses (female foeticide) (1). This has reduced the female-male child sex ratio in some sections of society; a healthy society needs a balanced ratio (1).

Short Answer · 2

Q80 Short Answer · 3 marks ★ Board ×1 1 paper

List four points of significance of reproductive health in a society. Name any two areas related to reproductive health which have improved over the past 50 years in our country.

Source: CBSE SA-II (old) · Series RLH 31/1 Q13 [F9 p.96]

✔ Answer
Significance: avoids unwanted pregnancies; keeps mother and child healthy; reduces sexually transmitted diseases; supports a balanced sex ratio and a healthy society (2). Areas improved: awareness of contraception / family planning; better care of mother and newborn (1).

⚠ **Note:** Old-syllabus wording; the 'areas improved over 50 years' part is not in the present NCERT text – practise only the first part.

Q81 Short Answer · 3 marks NEW

Surgery can be used to remove unwanted pregnancies. How is this misused? What has the law done about it, and why must the female-male sex ratio be maintained?

Source: NEW – written to fill this sub-theme (not from a past paper).

✔ Answer
Misuse: by people who do not want a child of a particular sex – sex-selective abortion of female foetuses (1). Law: prenatal sex determination has been prohibited (1). A healthy society needs a balanced female-male sex ratio; female foeticide is reducing the number of girl children in some sections of society (1).

Summary — questions by sub-theme and type

Sub-theme	Multiple Choice	Assertion-Reason	Very Short Answer	Short Answer	Long Answer	Case	Total	Board exams
Changes at puberty	3	1	1	–	–	2	7	2
Testes and scrotum	2	1	2	2	2	–	9	7
Path of sperms and the glands	2	1	1	2	3	–	9	4
Ovary, oviduct and uterus	1	–	1	–	3	2	7	3
Fertilisation, implantation and placenta	3	2	1	3	4	2	15	4
Egg not fertilised - menstruation	1	2	1	–	1	1	6	3
Germ cells and chromosome number	3	–	1	–	–	–	4	3
Methods of contraception	3	2	2	3	3	–	13	4
Sexually transmitted diseases	3	–	2	2	–	–	7	9
Sex ratio and prenatal sex determination	–	1	1	2	–	–	4	3
Total	**21**	**10**	**13**	**14**	**16**	**7**	**81**	

Top 10 — revise these the night before

#	Q	Question (short)	Type	★	Papers	Board
1	Q76	Write two examples each of sexually transmitted diseases caused by (i) virus, (ii) bacteria. Explain how the transmissio...	SA	★★★	6	4
2	Q39	What is placenta? Explain its function in human beings.	SA	★★	5	1
3	Q79	Give reasons for the following: Prenatal sex determination is banned in India.	VSA	★★	4	2
4	Q65	List and explain in brief three methods of contraception.	SA	★★	4	1
5	Q26	Where does fertilization occur in human females?	MCQ	★★	4	–
6	Q77	What does HIV stand for? Is AIDS an infectious disease? List any four modes of spreading AIDS.	SA	★★	3	2
7	Q10	Assertion (A): Testes in human males are located outside the abdominal cavity in scrotum.	AR	★★	3	1
8	Q33	In human beings, the implantation of fertilised egg takes place in which part of female reproductive system?	MCQ	★★	3	1
9	Q42	State briefly the changes that take place in a fertilised egg till the birth of the child in the human female reproducti...	LA	★★	3	–
10	Q71	Which out of them is STD?	MCQ	★★	3	–

Science with Abhishek Sir

PYQ HUNT · CBSE Class 10 Science (086) · 2026-27 syllabus

Chapter 8 – HEREDITY

Chapterwise question bank from past board papers, VI papers, KVS pre-boards, CBSE competency items and sample papers – with answers in NCERT words

Prepared by Abhishek Das, TGT (Science)

43	98	79	41
papers / item sets with this chapter	question appearances found	unique questions after clubbing	questions asked in CBSE board papers

What I went through

Kind of paper	Papers / sets with a Heredity question
CBSE board papers (incl. Summative Assessment)	23
KVS pre-boards and tests	10
Sample / practice papers	5
CBSE board papers – visually impaired	3
Competency / CFPQ items	2
Files searched	13 project files (10 docs + 3 OCR files) – see teacher's notes for coverage

In this chapter

Chapter cover	p. 204	Concept map	p. 205
Theme map + Must-do top 20	p. 206	Variation during reproduction	p. 208
Inherited traits in human beings	p. 211	Mendel's pea plant, dominant and recessive traits	p. 214
Monohybrid cross – one pair of traits	p. 217	Dihybrid cross – two pairs, independent inheritance	p. 225
Genes, DNA, proteins and chromosome number	p. 229	Sex determination	p. 232
Summary	p. 238		

How to read a question box: see page iv at the front of the book.

Concept map – where the questions come from

Variation during reproduction
6 questions · 6 appearances · Board 4
Most asked: Q1 – Offsprings formed as a result of sexual reproduction produce more vari...

Inherited traits in human beings
6 questions · 7 appearances · Board 2
Most asked: Q11 – Assertion (A): In humans, if gene (B) is responsible for black eyes an...

Mendel's pea plant, dominant and recessive traits
9 questions · 12 appearances · Board 4
Most asked: Q20 – What is meant by the terms (I) dominant, and (II) recessive traits? Ex...

Monohybrid cross – one pair of traits
25 questions · 33 appearances · Board 13
Most asked: Q46 – In one of his famous experiments of tracing the inheritance of traits ...

Dihybrid cross – two pairs, independent inheritance
9 questions · 12 appearances · Board 8
Most asked: Q55 – In order to trace the inheritance of traits Mendel crossed pea plants ...

Genes, DNA, proteins and chromosome number
6 questions · 6 appearances · Board 5
Most asked: Q57 – The statement that correctly describes the characteristic(s) of a gene...

Sex determination
16 questions · 22 appearances · Board 13
Most asked: Q75 – "The sex of the children in the human beings will be determined by wha...

Theme map (NCERT section order)

Theme	NCERT	Sub-theme	Qs	Board
Variation and inherited traits	8.1 – 8.2.1	Variation during reproduction	7	4
Variation and inherited traits	8.1 – 8.2.1	Inherited traits in human beings	6	2
Rules for inheritance – Mendel's work	8.2.2	Mendel's pea plant, dominant and recessive traits	9	4
Rules for inheritance – Mendel's work	8.2.2	Monohybrid cross – one pair of traits	25	13
Rules for inheritance – Mendel's work	8.2.2	Dihybrid cross – two pairs, independent inheritance	9	8
How traits are expressed and sex determination	8.2.3 – 8.2.4	Genes, DNA, proteins and chromosome number	7	5
How traits are expressed and sex determination	8.2.3 – 8.2.4	Sex determination	16	13

Must-do top 20

#	Q	Type	Question (first line)	Papers	Board	★
1	Q75	SA	"The sex of the children in the human beings will be determined by what they inherit from their	5	2	★★
2	Q20	VSA	What is meant by the terms (I) dominant, and (II) recessive traits? Explain.	4	3	★★
3	Q46	CASE	In one of his famous experiments of tracing the inheritance of traits when Mendel cross-pollina	4	2	★★
4	Q55	CASE	In order to trace the inheritance of traits Mendel crossed pea plants having one contrasting ch	3	2	★★
5	Q23	MCQ	In a cross between two tall pea plants a few dwarf pea plants were also obtained in F1 generati	2	2	★
6	Q48	MCQ	Two pea plants, one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds	2	2	★
7	Q72	VSA	State one genetically different feature between sperms and eggs of humans. What is its conseque	2	2	★
8	Q11	AR	Assertion (A): In humans, if gene (B) is responsible for black eyes and gene (b) is responsible	2	1	★
9	Q34	VSA	A blue colour flower plant denoted by BB is cross-bred with that of a white colour flower plant	2	1	★
10	Q47	CASE	In a cross breeding pea plants with violet flowers and plants with white flowers the all offspr	2	1	★
11	Q77	CASE	The mechanism by which the sex of an individual is determined is called sex-determination. In h	2	1	★
12	Q38	SA	Name the plant Mendel used for his experiment. What type of progeny was obtained by Mendel in F	2	0	★
13	Q39	SA	Draw and explain the monohybrid cross between round and wrinkled seeded pea plants.	2	0	★
14	Q1	MCQ	Offsprings formed as a result of sexual reproduction produce more variations because	1	1	★
15	Q3	AR	Assertion (A): When a bacterium divides into two, and the resultant two bacteria divide again,	1	1	★

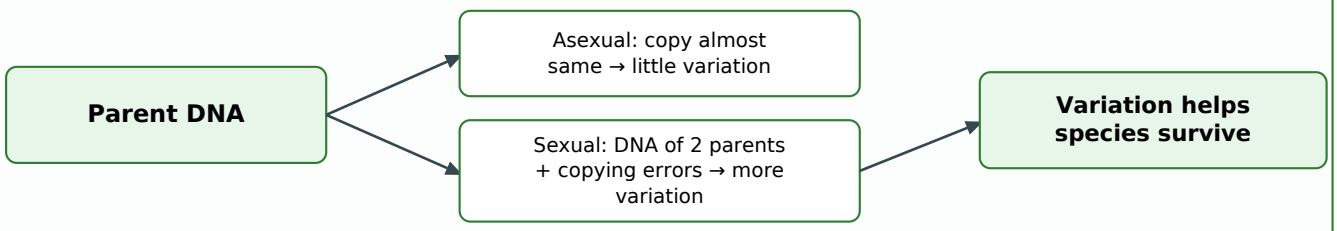
#	Q	Type	Question (first line)	Papers	Board	★
16	Q4	AR	Assertion (A): Variations are not often seen in off-springs produced by asexual reproduction.	1	1	★
17	Q7	CASE	Indian scientists helped crack the DNA code of 'bread-wheat' genome, which would help improve g	1	1	★
18	Q8	MCQ	Identify the traits that cannot be transmitted from parents to the off-springs:	1	1	★
19	Q21	VSA	(a) List any two pairs of visible contrasting characters of garden pea plants used by Mendel fo	1	1	★
20	Q24	MCQ	A cross made between two pea plants produces 50% tall and 50% short pea plants. The gene combin	1	1	★

Science with Abhishek Sir

Variation during reproduction

Variation and inherited traits · NCERT 8.1 – 8.2.1 · 7 questions · Board appearances 4 · Prepared by Abhishek Das, TGT (Science)

Picture it



Small changes in DNA copying give variations. Sexual reproduction gives more variation. Variations help a species survive.

Multiple Choice

Q1 **Multiple Choice · 1 mark** ★ **Board ×1** **1 paper**

Offsprings formed as a result of sexual reproduction produce more variations because

(A) genetic material is contributed by many parents.
(B) sexual reproduction is a lengthy process.
(C) genetic material is contributed by two individuals of same species to produce a new generation.
(D) DNA copying is not accompanied by the creation of cellular apparatus.

Source: CBSE 31/3/3 Q11 (2024) [F1]

✔ Answer
(C) genetic material is contributed by two individuals of same species to produce a new generation.

Q2 **Multiple Choice · 1 mark** ★ **1 paper**

Exchange of genetic material takes place in

(a) vegetative reproduction
(b) sexual reproduction
(c) asexual reproduction
(d) budding

Source: KVS Lucknow 1st Pre-board Q16 (2022-23) [FM]

✔ Answer
(b) sexual reproduction

Assertion-Reason

Q3 **Assertion-Reason · 1 mark ★** **Board ×1** **1 paper**

Assertion (A): When a bacterium divides into two, and the resultant two bacteria divide again, the four bacteria produced would be almost similar.
Reason (R): DNA copying involves small inaccuracies in the reproduction process.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: CBSE 31/2/1, 31/2/2, 31/2/3 Q18/19/20 (2023) [F1]

✔ Answer
(a) Both A and R are true and R is the correct explanation of A.
• The four bacteria are almost similar (not exactly the same) because DNA copying has small inaccuracies. [1]

⚠ **Note** The key word is 'almost'. Tiny differences come from small errors in DNA copying – so R explains A.

Q4 **Assertion-Reason · 1 mark ★** **Board ×1** **1 paper**

Assertion (A): Variations are not often seen in off-springs produced by asexual reproduction.
Reason (R): DNA molecule generated by replication is not similar to the original DNA.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: CBSE 31/4/1 Q8 (also 31/4/3 Q9) (2026) [F4, p.370]

✔ Answer
(C) Assertion (A) is true, but Reason (R) is false.
• In asexual reproduction the DNA copy is similar to the original (only small errors), so offspring show very little variation. [1]

Q5 **Assertion-Reason · 1 mark ★** **1 paper**

Assertion: Probability of survival of an organism produced through sexual reproduction is more than that of organism produced through asexual mode.
Reason: Variations provide advantages to individuals for survival.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: KVS Lucknow 1st Pre-board Q19 (2024-25) [FM]

✔ Answer
(a) Both A and R are true and R is the correct explanation of A. [1]

Very Short Answer

Q6 **Very Short Answer · 2 marks** NEW

What is heredity? Why do the offspring of sexually reproducing organisms show more variation than those produced asexually?

Source: NEW – practice question written in NCERT words (not from a past paper)

✔ Answer
• Heredity is the passing of traits (characters) from parents to offspring. [1]
• In sexual reproduction DNA from two parents combines, and there are also small errors in DNA copying; in asexual reproduction only small copying errors occur. [1]

Case / Source-based

Q7 **Case / Source-based · 4 marks ★** Board ×1 1 paper

Indian scientists helped crack the DNA code of 'bread-wheat' genome, which would help improve global food security. It will allow faster breeding for climate-resilient varieties with drought, heat and frost tolerance, disease-resistant and superior quality grain. The information generated will help identify genes controlling yield, grain quality, resistance to diseases, etc.
(a) Write the full form of DNA. (1)
(b) What type of cell division is involved in the formation of gametes? (1)
(c) (i) Variations confer an advantage to an individual to survive. Justify. (2)
OR (c) (ii) How do genes control characteristics or traits? (2)

Source: CBSE 31/7/1 & 31/7/2 Q15 (2026) [F4]

✔ Answer
(a) Deoxyribonucleic acid. [1]
(b) A special kind of cell division that halves the chromosome number (reduction division / meiosis). [1]
(c)(i) • Variations are useful when conditions change (heat, drought, disease). [1]
• Individuals with a suitable variation survive and pass it on, e.g. bacteria that can bear heat survive a heat wave. [1]
OR (c)(ii) • A gene is a section of DNA that gives information for making one protein. [1]
• The protein (often an enzyme) controls the trait, e.g. an efficient enzyme makes more plant hormone → tall plant; a less efficient enzyme → short plant. [1]

Inherited traits in human beings

Variation and inherited traits · NCERT 8.1 – 8.2.1 · 6 questions · Board appearances 2 · Prepared by Abhishek Das, TGT (Science)

Picture it



Each child gets one copy of the gene from each parent. Learnt skills (swimming, dancing) are NOT inherited.

Traits like free/attached ear lobe and eye colour pass from parents to children. Each child gets one copy of a gene from each parent.

Multiple Choice

Q8 **Multiple Choice · 1 mark ★** **Board ×1** **1 paper**

Identify the traits that cannot be transmitted from parents to the off-springs:
(i) Swimming technique (ii) Blood group (iii) Eye colour (iv) Dancing skills

(A) (i) and (ii)
(B) (i) and (iv)
(C) (iii) and (iv)
(D) (ii) and (iii)

Source: CBSE 31/4/1 Q4 (2026) [F4, p.368]

✔ Answer
(B) (i) and (iv) – swimming technique and dancing skills are learnt, not inherited.

Q9 **Multiple Choice · 1 mark ★** **1 paper**

Attached earlobes in humans is an inherited condition. The allele for attached earlobes is recessive. What are the chances of parents, both having attached earlobes, to have a child with attached earlobes?

0%
25%
75%
100%

Source: CBSE competency item (Heredity) Q5 (CFPQ) [F4]

✔ Answer
100% – both parents are ff, so every child gets f from each parent (ff).

Q10 **Multiple Choice · 1 mark ★** **1 paper**

A trait in an organism is influenced by

(a) paternal DNA only
(b) maternal DNA only
(c) both maternal and paternal DNA
(d) neither by paternal nor by maternal DNA

Source: KVS Lucknow Pre-board (Set-1) Q8 (yr?) [FM]

✔ Answer
(c) both maternal and paternal DNA

Assertion–Reason

Q11 **Assertion–Reason · 1 mark ★** **Board ×1 2 papers**

Assertion (A): In humans, if gene (B) is responsible for black eyes and gene (b) is responsible for brown eyes, then the colour of eyes of the progeny having gene combination Bb, bb or BB will be black only.
Reason (R): The black colour of the eyes is a dominant trait.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: CBSE 31/4/1 Q18 (2023) [F1] · KVS Lucknow Monthly Oct Q9 (2024-25) [FM]

✔ Answer
(d) (A) is false but (R) is true.
• Bb and BB give black eyes, but bb gives brown eyes. [1]

Short Answer

Q12 **Short Answer · 3 marks ★** **1 paper**

Nivedita has dark brown eyes, like her mother. But she has the same shaped nose as her father.
(a) Explain why Nivedita has features from both of her parents.
(b) Explain why Nivedita is genetically female.

Source: British Council competency item (Science10DP3) (CFPQ) [F5]

✔ Answer
(a) • She was born by sexual reproduction. • She got half her genes (DNA) from her mother and half from her father. • These genes control her traits, so she shows features of both. [1½]
(b) • She has two X chromosomes (XX) in her sex-chromosome pair. • The sperm that fertilised the egg carried an X chromosome. [1½]

Case / Source-based

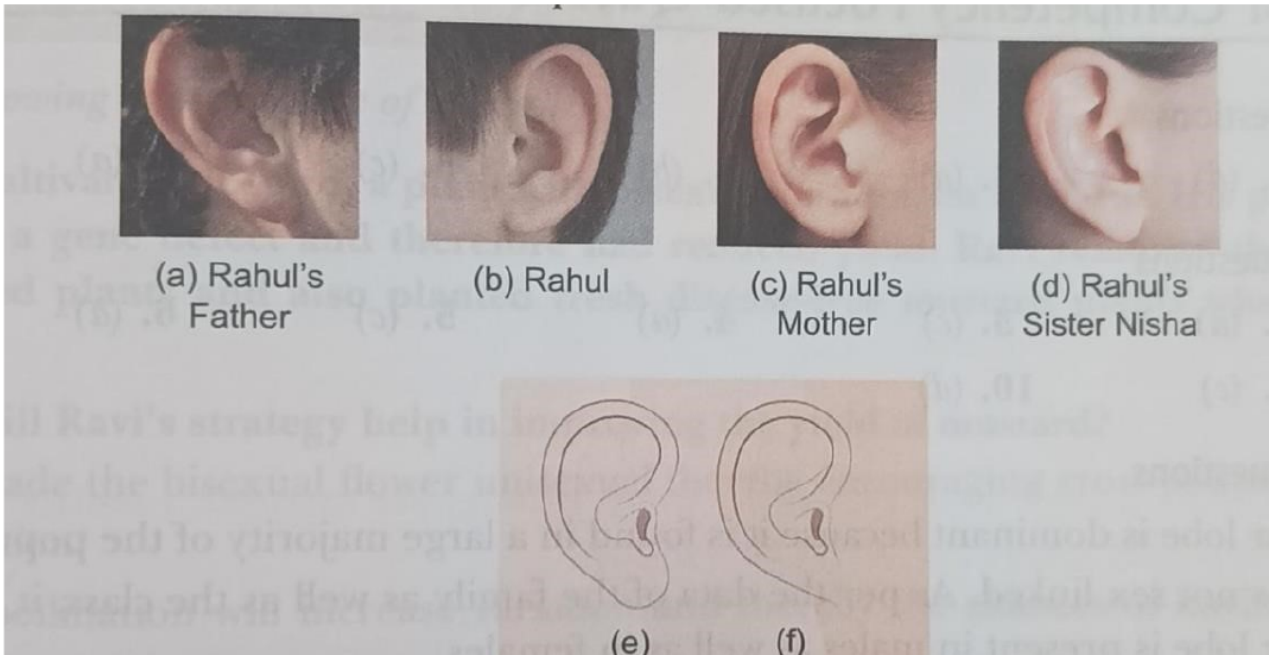
Q13 **Case / Source-based · 4 marks** ★ **1 paper**

Figures (a) to (d) represent the type of ear lobes present in a family consisting of 2 children – Rahul, Nisha and their parents. Rahul conducted a survey of ear lobes in his classmates:

Sex | Free | Attached
(i) | 36 | 14
(ii) | 31 | 19

(i) Which of the two characteristics – 'free ear lobe' or 'attached ear lobe' appears to be dominant in this case? Why?
(ii) Is the inheritance of the free ear lobe linked with sex of the individual? Give reason.
(iii) What type of ear lobe is present in father, mother, Rahul and his sister Nisha? Write the genetic constitution of each family member. (F = free, f = attached)

Figure from the question paper



Source: KVS Lucknow Pre-board 2 Q38 (2024-25) [FM, p.27]

✔ Answer

(i) Free ear lobe is dominant – it is found in more students (67 free : 33 attached, about 2 : 1 in both groups). [1]
(ii) No – free and attached ear lobes are found in both boys and girls in almost the same proportion, so the trait is not linked with sex. [1]
(iii) Father – free, mother – free, Rahul – attached, Nisha – free. [1]
Father Ff, mother Ff, Rahul ff, Nisha FF or Ff. Rahul is ff, so he got f from each parent; both parents are free, so each must be Ff. [1]

Mendel's pea plant, dominant and recessive traits

Rules for inheritance – Mendel's work · NCERT 8.2.2 · 9 questions · Board appearances 4 · Prepared by Abhishek Das, TGT (Science)

Picture it

Dominant (shows in F1)	Recessive (hidden in F1)
Tall	Short
Round seed	Wrinkled seed
Violet flower	White flower
Yellow seed	Green seed

Why pea?
clear contrasting characters,
quick to grow, many seeds,
self-pollinating bisexual flowers

Mendel used garden pea with contrasting characters: tall/short, round/wrinkled seeds, violet/white flowers, yellow/green seeds. The trait that shows in F1 is dominant; the hidden one is recessive.

Multiple Choice

Q14 **Multiple Choice · 1 mark** ★ **1 paper**

Which one of Mendel's law states that when two homozygous individuals with one or more sets of contrasting characteristics are crossed, the characteristics which appear in F1 hybrids are dominant and those which do not are recessive?

(a) Law of segregation
(b) Law of dominance
(c) Law of independent assortment
(d) None of these

Source: KVS Delhi Pre-board II Q9 (2024-25) [FM]

✔ Answer
(b) Law of dominance

Q15 **Multiple Choice · 1 mark** ★ **1 paper**

Pure-breed pea plant A is crossed with pure-breed pea plant B. It is found that the plants which look like A do not appear in F1 generation but re-emerge in F2 generation. Which of the plants A and B are tall and dwarf?

(a) A are tall and B are dwarf.
(b) A are tall and B are also tall.
(c) A are dwarf and B are also dwarf
(d) A are dwarf and B are tall

Source: KVS Lucknow Pre-board II Q10 (2023-24) [FM]

✔ Answer
(d) A are dwarf and B are tall – the trait hidden in F1 and seen again in F2 is recessive (dwarf).

Q16 **Multiple Choice · 1 mark ★** **1 paper**

The genotype of the height of an organism is written as Tt. What conclusion can be drawn?

(a) The allele for height has at least two different genes.
(b) There are at least two different alleles for the gene of height.
(c) There are two different genes for height, each having a single allele.
(d) There is one allele for height with two different forms.

Source: KVS Lucknow Pre-board Q4 (2025-26) [FM]

✔ Answer
(b) There are at least two different alleles for the gene of height.

Assertion–Reason

Q17 **Assertion–Reason · 1 mark ★** **1 paper**

Assertion (A): Mendel selected the pea plant for his experiments.
Reason (R): Pea plant is cross-pollinating and has unisexual flowers.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: KVS Lucknow Pre-board II Q19 (2023-24) [FM]

✔ Answer
(c) A is true but R is false.
• Pea flowers are bisexual and normally self-pollinating. [1]

Q18 **Assertion–Reason · 1 mark ★** **1 paper**

Assertion: Recessive traits can only be expressed in homozygous condition.
Reason: Dominant trait cannot be expressed in heterozygous condition.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: KVS Lucknow Pre-board Q8 (2025-26) [FM]

✔ Answer
(C) Assertion is true but Reason is false.
• A dominant trait is expressed even in the heterozygous condition (Tt is tall). [1]

Q19 **Assertion–Reason · 1 mark ★** **1 paper**

Assertion (A): A geneticist crossed a pea plant having violet flowers with a pea plant with white flowers, he got all violet flower in the first generation.
Reason (R): White colour genes are not passed into next generation.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: KVS Lucknow 1st Pre-board Q18 (2022-23) [FM]

✔ Answer
(c) A is true but R is false.
• The white gene is passed to F1 but is not expressed; white flowers reappear in F2. [1]

Very Short Answer

Q20 **Very Short Answer · 2 marks** ★★ **Board ×3 4 papers**

What is meant by the terms (I) dominant, and (II) recessive traits? Explain.

Source: CBSE 31/1/1-3 Q37/38 (b) 'Differentiate dominant and recessive' (2023) [F1] · CBSE VI 31(B)/S CDBA/S Q38(b) (yr?) [F1] · CBSE VI 31(B)/S EFGH/S Q38(b) (yr?) [F1] · Practice paper case Q15 OR (SQP/practice) [F6]

✓ Answer
(I) Dominant trait – the trait that is expressed in F1 (it shows even when only one copy of its gene is present), e.g. tallness. [1]
(II) Recessive trait – the trait that is present at the gene level but does not show in F1; it shows only when both copies are recessive (tt), e.g. shortness. [1]

⚠ **Note** Asked as the 1-mark part (b) of many case questions and as a 2-mark OR in a practice case. Learn it well.

Q21 **Very Short Answer · 2 marks** ★ **Board ×1 1 paper**

(a) List any two pairs of visible contrasting characters of garden pea plants used by Mendel for his experiments stating the dominant and recessive characters in each pair.

Source: CBSE 31/3/1 Q23(a), 31/3/2 Q25(a), 31/3/3 Q22(a) (2024) [F1]

✓ Answer
Any two pairs [1 + 1]:
• Tall plant (dominant) / short plant (recessive)
• Round seed (dominant) / wrinkled seed (recessive)
• Violet flower (dominant) / white flower (recessive)
• Yellow seed (dominant) / green seed (recessive)

Short Answer

Q22 **Short Answer · 3 marks** ★ **1 paper**

Suggest three reasons why Mendel studied pea plants.

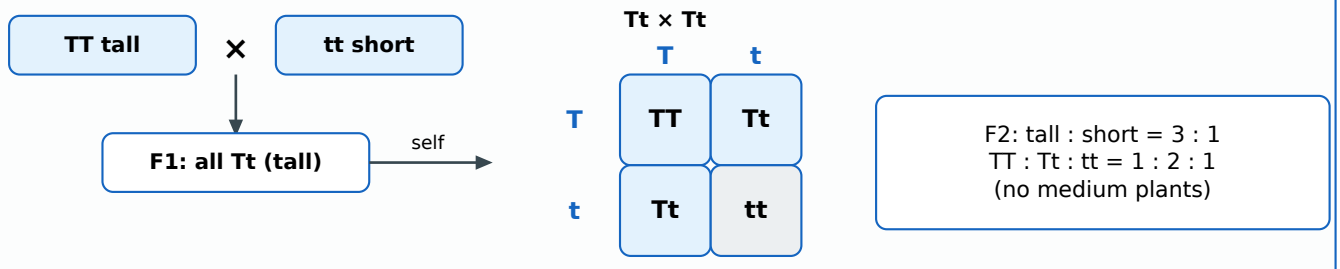
Source: British Council competency item (Science10DP6) (CFPQ) [F5]

✓ Answer
Any three [1 × 3]: • Easy to grow. • Clear, easily seen contrasting characters. • Grow quickly, so many generations in a short time. • Easy to pollinate by hand (flowers are bisexual and self-pollinating).

Monohybrid cross – one pair of traits

Rules for inheritance – Mendel's work · NCERT 8.2.2 · 25 questions · Board appearances 13 · Prepared by Abhishek Das, TGT (Science)

Picture it



TT × tt → F1 all Tt (tall). F1 self-pollinated → F2 = TT : Tt : tt = 1 : 2 : 1, tall : short = 3 : 1.

Multiple Choice

Q23 Multiple Choice · 1 mark ★ Board ×2 2 papers

In a cross between two tall pea plants a few dwarf pea plants were also obtained in F1 generation. It is possible only if the gene combination of the parental plants is:

(A) TT and Tt
(B) TT and tt
(C) Tt and tt
(D) Tt and Tt

Source: CBSE VI 31(B)/S CDBA/S Q12 (yr?) [F1] · CBSE 31/3/1 Q12, 31/3/2 Q11 (2024) [F1]

✔ Answer
(D) Tt and Tt – only when both parents carry t can a tt (dwarf) plant be formed.

⚠ **Note** In the 2024 paper the options are in a different order: Tt and Tt is option (A).

Q24 Multiple Choice · 1 mark ★ Board ×1 1 paper

A cross made between two pea plants produces 50% tall and 50% short pea plants. The gene combination of the parental pea plants must be:

(A) TT and tt
(B) Tt and Tt
(C) Tt and tt
(D) TT and Tt

Source: CBSE VI 31(B)/S EFGH/S Q12 (yr?) [F1]

✔ Answer
(C) Tt and tt – Tt × tt gives Tt : tt = 1 : 1.

Q25 **Multiple Choice · 1 mark ★** **Board ×1 1 paper**

A cross between pea plant with white flowers (vv) and pea plant with violet flowers (VV) resulted in F2 progeny in which ratio of violet (VV) and white (vv) flowers will be:

(a) 1 : 1
(b) 2 : 1
(c) 3 : 1
(d) 1 : 3

Source: CBSE 31/4/1 Q10, 31/4/3 Q12 (2023) [F1]

✔ Answer
(c) 3 : 1 (violet plants = VV + Vv).

⚠ **Note** The question labels violet as (VV) but violet plants in F2 are VV and Vv. Pure VV : vv would be 1 : 1 – teach students to read what the question means (violet : white).

Q26 **Multiple Choice · 1 mark ★** **Board ×1 1 paper**

In an experiment with pea plants, a pure tall plant (TT) is crossed with a pure short plant (tt). The ratio of pure tall plant to pure short plants in F2 generation will be

(a) 1 : 3
(b) 3 : 1
(c) 1 : 1
(d) 2 : 1

Source: CBSE 31/6/2 Q14, 31/6/3 Q15 (2023) [9-compressed-1-64 OCR, p.11]

✔ Answer
(c) 1 : 1 – F2 = 1 TT : 2 Tt : 1 tt; pure tall (TT) : pure short (tt) = 1 : 1.

Q27 **Multiple Choice · 1 mark ★** **Board ×1 1 paper**

The genotype of green stemmed tomato plant is denoted by 'GG' and that of purple stemmed tomato plant as 'gg'. Hybrid of a cross between these two were self-pollinated to obtain F2 progeny. What will be the ratio of GG, Gg and gg in this F2 progeny?

(A) 2 : 1 : 1
(B) 3 : 1 : 0
(C) 1 : 1 : 2
(D) 1 : 2 : 1

Source: CBSE LMNK2 31/2/1 Q1, 31/2/2 Q2, 31/2/3 Q4 (2026) [F2/F3/F9, p.309]

✔ Answer
(D) 1 : 2 : 1

Q28 **Multiple Choice · 1 mark ★** **Board ×1 1 paper**

Mendel crossed pea plants having yellow seeds (YY) with pea plants having green seeds (yy). Yellow seeds are obtained in F1 progeny which undergoes self-pollination to produce F2 progeny. Select the option showing the result of F2 progeny.

(A) 3 green : 1 yellow
(B) 1 yellow : 1 green
(C) 3 yellow : 1 green
(D) 2 green : 2 yellow

Source: CBSE 31/7/2 Q (Sec A) (2026) [F4]

✔ Answer
(C) 3 yellow : 1 green

Q29 **Multiple Choice · 1 mark ★** **1 paper**

A cross between a tall plant (TT) and short pea plant (tt) resulted in progeny that were all tall plants because

(a) tallness is the dominant trait
(b) shortness is the dominant trait
(c) tallness is the recessive trait
(d) height of pea plant is not governed by gene 'T' or 't'

Source: KVS Lucknow 1st Pre-board Q15 (2022-23) [FM]

✔ Answer
(a) tallness is the dominant trait

Q30 **Multiple Choice · 1 mark ★** **1 paper**

If a tall pea plant is crossed with a pure dwarf pea plant then, what percentage of F1 and F2 generation respectively will be tall?

(a) 25%, 25%
(b) 50%, 50%
(c) 75%, 100%
(d) 100%, 75%

Source: KVS Lucknow 1st Pre-board Q10 (yr?) [FM]

✔ Answer
(d) 100%, 75%

⚠ **Note** The key assumes the tall parent is pure (TT). If the tall plant were Tt, F1 would be only 50% tall. Say 'pure tall' when teaching.

Q31 **Multiple Choice · 1 mark ★** **1 paper**

In a cross between black furred goat (G) and white furred goat (g), all offspring were found to have black fur. What can be inferred about the genetic makeup of the parents?

(a) GG X gg
(b) Gg X Gg
(c) Gg X gg
(d) gg X gg

Source: KVS Lucknow Pre-board Q5 (2025-26) [FM]

✔ Answer
(a) GG × gg

⚠ **Note** Paper says 'parent rabbits' – a typing slip for goats; wording corrected here.

Q32 **Multiple Choice · 1 mark ★** **1 paper**

A monohybrid cross is conducted between one variety of pea plants having pods that are full (FF) and another having pods that are constricted (ff). What is the percentage of heterozygous offsprings in F1 generation?

100% 50%
75% 25%

Source: CBSE competency item (Heredity) Q6 (CFPQ) [F4]

✔ Answer
100% – all F1 plants are Ff.

Q33 **Multiple Choice · 1 mark ★** **1 paper**

Two tall pea plants are used to produce a progeny of 20 pea plants. The two parent plants have a genotype of TT and Tt respectively. How many short pea plants will be found in the progeny in the F1 generation?

Source: CBSE competency item (Heredity) Q11 (CFPQ) [F4]

✔ Answer
Zero – TT × Tt gives only TT and Tt, all tall.

Very Short Answer

Q34 **Very Short Answer · 2 marks ★** **Board ×1** **2 papers**

A blue colour flower plant denoted by BB is cross-bred with that of a white colour flower plant denoted by bb.
(a) State the colour of the flower you would expect in their F1 generation plants.
(b) What must be the percentage of white flower plants in F2 generation if flowers of F1 plants are self-pollinated?
[(c) State the expected ratio of the genotypes BB and Bb in the F2 progeny.]

Source: KVS Delhi Pre-board II Q25 (2024-25) [FM] · CBSE BRH/1 (Summative Assessment-II) Q17 – 3 marks (pre-2020) [Merged_OCR (F5 supplement), p.7]

✔ Answer
(a) Blue (all F1 are Bb). [1]
(b) 25% white (bb). [1]
(c) BB : Bb = 1 : 2. [1 – only in the 3-mark version]

Q35 **Very Short Answer · 2 marks** ★ **Board ×1** **1 paper**

Mendel crossed a pure tall pea plant (TT) with a pure short pea plant (tt) and obtained all tall plants in F1 generation.
(a) What is the gene combination present in the plants of F1 generation?
(b) Give reason why only tall plants are observed in F1 progeny.
(c) What will be the ratio of the plants obtained in the F2 generation when F1 plants are self-pollinated?

Source: CBSE 31/2/1 Q23, 31/2/2 Q24, 31/2/3 Q24 (2023) [F1]

✔ Answer
(a) Tt [½]
(b) Tallness (T) is dominant; the short gene (t) is present but not expressed. [½]
(c) Tall : short = 3 : 1 (TT : Tt : tt = 1 : 2 : 1). [1]

Q36 **Very Short Answer · 2 marks** ★ **1 paper**

A Mendelian experiment consisted of breeding pea plants bearing violet flowers (VV) with pea plants bearing white flowers (vv). What will be the result in F1 progeny?

Source: KVS Lucknow Pre-board (Set-1) Q24 (yr?) [FM]

✔ Answer
• All F1 plants have violet flowers. [1]
• Their gene combination is Vv; violet is dominant, white (v) is present but not expressed. [1]

Q37 **Very Short Answer · 2 marks** ★ **1 paper**

Pea plants can have green or yellow seeds. One of the phenotypes shows dominance over the other. A farmer pollinates a flower of a plant with green seeds using pollen from a flower of a plant with yellow seeds. The resulting pod has all green seeds.
(a) What should be the genotype of the parent plants to get green and yellow seeds in equal proportions?
(b) The farmer crosses two heterozygous green seeded plants and obtains 100 plants. What would be the number of green and yellow seeds respectively?

Source: CBSE competency item (Heredity) Q16, Q17 (CFPQ) [F4]

✔ Answer
In this question green is dominant (the pod had all green seeds). Let G = green, g = yellow.
(a) Gg (green) × gg (yellow) → 1 : 1. [1]
(b) Gg × Gg → 75 green : 25 yellow. [1]

⚠ **Note** In Mendel's real peas yellow is dominant. This item makes green dominant through its own data – answer from the data given.

Short Answer

Q38 **Short Answer · 3 marks** ★ **2 papers**

Name the plant Mendel used for his experiment. What type of progeny was obtained by Mendel in F1 and F2 generations when he crossed the tall and short plants? Write the ratio he obtained in F2 generation plants.

Source: KVS Lucknow Pre-board Q13 (2025-26) [FM] · Practice paper Q13 (SQP/practice) [F6]

✔ Answer
• Garden pea (Pisum sativum). [½]
• F1: all tall plants (no medium-height plants). [1]
• F2: both tall and short plants; about three-quarters tall and one-quarter short. [1]
• Ratio tall : short = 3 : 1. [½]

Q39 **Short Answer · 3 marks** ★ **2 papers**

Draw and explain the monohybrid cross between round and wrinkled seeded pea plants.

Source: KVS Lucknow Pre-board Q13 (2025-26) [FM] · Practice paper answer key Q13 (SQP/practice) [F6]

✔ Answer
Parents RR (round) × rr (wrinkled); gametes R and r. [½]
F1: all Rr – round (round is dominant). [1]
F1 self-pollinated: Rr × Rr → RR, Rr, Rr, rr. [1]
F2: round : wrinkled = 3 : 1; RR : Rr : rr = 1 : 2 : 1. [½]
(Draw the cross as a checker-board.)

Q40 **Short Answer · 3 marks** ★ **Board ×1** **1 paper**

A tall pea plant (TT) is crossed with a dwarf pea plant (tt). Find out F1 and F2 progeny. Also mention the processes that lead to the formation of F1 and F2 progeny during the cross.

Source: CBSE VI 31(B) LMNK2 Q13 (2026) [F1]

✔ Answer
Parents: TT × tt; gametes T and t. [½]
F1: all Tt – tall. Process: cross-pollination (crossing) of the two parents. [1]
F2 (F1 self-pollinated, Tt × Tt): TT, Tt, Tt, tt → 3 tall : 1 dwarf; TT : Tt : tt = 1 : 2 : 1. Process: self-pollination of F1. [1½]

Q41 **Short Answer · 3 marks** ★ **1 paper**

Sahil crossed tall pea plants (TT) with short pea plants (tt) and obtained all tall plants in F1 generation.
(a) What will be set of genes present in the F1 generation?
(b) Give reason why only tall plants are observed in F1 progeny.
(c) When F1 plants were self-pollinated, a total of 800 plants were produced. How many of these would be tall, medium height or short plants?

Source: KVS Lucknow 1st Pre-board Q28 (2022-23) [FM]

✔ Answer
(a) Tt [1]
(b) Tall (T) is dominant over short (t). [1]
(c) Tall = ¾ × 800 = 600; medium height = 0 (no blending); short = ¼ × 800 = 200. [1]

Q42 **Short Answer · 3 marks ★** **1 paper**

The genotype of green stemmed tomato plant is denoted as GG and that of purple stemmed tomato plant as gg. When these two are crossed:
(A) What colour of the stem would you expect in their F1 progeny?
(B) Give the percentage of purple stemmed plants if F1 plants are self pollinated.
(C) In what ratio would you find genotypes GG and Gg in the F2 progeny?

Source: KVS Lucknow Pre-board 2 Q29 (2024-25) [FM]

✔ Answer
(A) Green stem (all Gg). [1]
(B) 25% purple (gg). [1]
(C) GG : Gg = 1 : 2. [1]

Q43 **Short Answer · 3 marks ★** **1 paper**

The allele for tallness in pea plants is T. The allele for dwarfism is t. Draw a genetic diagram to show the genotypes of the offspring of a heterozygous tall pea plant and a homozygous dwarf pea plant. State the ratio of the phenotypes.

Source: British Council competency item (Science10CKV5) (CFPQ) [F5]

✔ Answer
Parents: Tt × tt [½]; gametes T, t and t [½]
Offspring: Tt, Tt, tt, tt [1]
Tall : dwarf = 1 : 1 [1]

Long Answer

Q44 **Long Answer · 5 marks ★** **1 paper**

(a) In the garden pea, round shape of seed is dominant over wrinkled shape. A pea plant heterozygous for round shape of seed is self-pollinated and 1600 seeds produced during the cross are subsequently germinated. How many seedlings would have non parental phenotype? Give proper explanation for your answer.
(b) Which trait is not expressed in F1 generation? Why?
(c) Give genotypic ratio of F2 generation.
(d) Which character in height of pea plant is dominant?

Source: KVS Lucknow Pre-board II Q34 (2023-24) [FM]

✔ Answer
(a) Rr × Rr → RR : Rr : rr = 1 : 2 : 1. The parent is round, so the non-parental phenotype is wrinkled (rr) = ¼ × 1600 = 400 seedlings. [2]
(b) The recessive trait (e.g. shortness / wrinkled) – it is masked by the dominant gene when both are present. [1]
(c) 1 : 2 : 1 (TT : Tt : tt). [1]
(d) Tallness. [1]

Q45 **Long Answer · 5 marks ★** **1 paper**

Consider a pea plant that is recessive for plant height. Its genotype is tt and is dwarf.
(a) Assuming that the gene for plant height obeys Mendel's laws of inheritance, indicate the genotypes and phenotypes of ALL the possible parent pairs that could have dwarf offspring.
(b) Using any of the parent pairs mentioned by you in (a), perform a cross to show the genotypes of the offspring that might arise in the next generation.

Source: CBSE competency item (Heredity) Q10 (CFPQ) [F4]

✔ Answer
(a) Each parent must give one t [3]:
• Tt (tall) × Tt (tall)
• Tt (tall) × tt (dwarf)
• tt (dwarf) × tt (dwarf)
(b) e.g. Tt × tt → gametes T, t and t → Tt, Tt, tt, tt → tall : dwarf = 1 : 1. [2]

Case / Source-based

Q46 **Case / Source-based · 4 marks ★★** **Board ×2 4 papers**

In one of his famous experiments of tracing the inheritance of traits when Mendel cross-pollinated a pure tall pea plant with a pure dwarf pea plant, he got only tall pea plants in the F1 generation. When F1 tall pea plants were self-pollinated, Mendel got F2 generation pea plants in which both tall and dwarf pea plants were present.
(a) List any two pairs of contrasting characters, other than those mentioned above used by Mendel in his experiments. (1)
(b) Differentiate between dominant and recessive traits. (1)
(c) (i) State the ratio of tall pea plants and dwarf pea plants in F2 generation. Give reason for the appearance of dwarf pea plants in F2 generation. (2)
OR (c) (ii) Differentiate between F1 generation and F2 generation in context of Mendel's experiment. (2)

Source: CBSE VI 31(B)/S CDBA/S Q38 (yr?) [F1] · KVS Lucknow Monthly Oct Q17 (tall×dwarf, 4 parts) (2024-25) [FM] · KVS Lucknow 1st Pre-board Q38 (yr?) [FM] · Old CBSE paper 31/1 – 3-mark version (pre-2020) [F6 OCR]

✔ Answer
(a) Round/wrinkled seeds; violet/white flowers (or yellow/green seeds). [½ + ½]
(b) Dominant trait shows in F1; recessive trait is hidden in F1 and shows only when both copies are recessive. [1]
(c)(i) Tall : dwarf = 3 : 1. [1] The F1 plants (Tt) carry the dwarf gene t; on self-pollination some plants get t from both parents (tt) and become dwarf. [1]
OR (c)(ii) F1 – produced by crossing the two pure parents; all plants alike (tall, Tt). F2 – produced by self-pollination of F1; both tall and dwarf plants in 3 : 1. [1 + 1]

⚠ **Note** Also asked as: F1 look, gene combination, why short gene not expressed, % tall in F2 (75%), F2 ratio + conclusion (KVS Monthly Oct 2024-25); 'plants not found in F1 but appeared in F2 and reason' (KVS PB and old CBSE 31/1).

Q47 **Case / Source-based · 4 marks ★** **Board ×1 2 papers**

In a cross breeding pea plants with violet flowers and plants with white flowers the all offspring of F1 generation had violet flowers. When the F1 generation was self-crossed, it was observed that both type of plants were produced.
i. What are the genotypes of the F1 progeny? (1)
ii. What is the genotype ratio of plants in F2 generation? (1)
iii. Draw the suitable flow chart showing above cross. (2)
OR iii. If 200 plants were obtained in F2 generation how many of them will be with violet and white flowers respectively? (2)

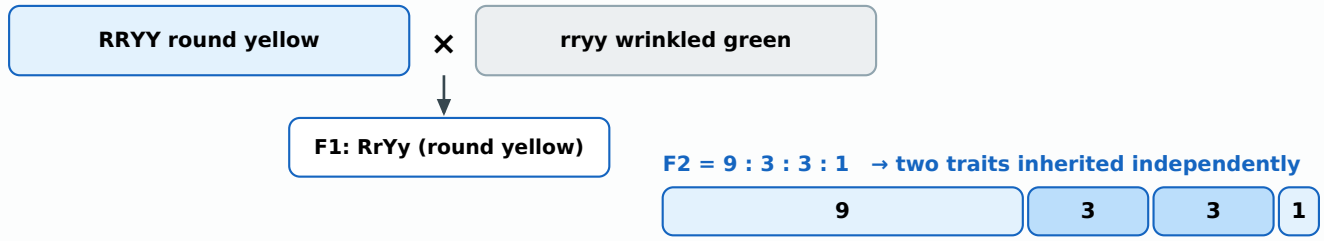
Source: KVS Lucknow 1st Pre-board Q38 (2024-25) [FM] · CBSE 31/1/1-3 Q37/38 (c) OR – violet × white diagram (2023) [F1]

✓ Answer
i. Vv [1]
ii. VV : Vv : vv = 1 : 2 : 1 [1]
iii. VV × vv → gametes V, v → F1 Vv (violet) → Vv × Vv → VV, Vv, Vv, vv → 3 violet : 1 white. [2]
OR iii. Violet = ¾ × 200 = 150; white = ¼ × 200 = 50. [2]

Dihybrid cross – two pairs, independent inheritance

Rules for inheritance – Mendel's work · NCERT 8.2.2 · 9 questions · Board appearances 8 · Prepared by Abhishek Das, TGT (Science)

Picture it



RRYY × rryy → F1 all RrYy (round yellow). F2 = 9 round yellow : 3 round green : 3 wrinkled yellow : 1 wrinkled green. New combinations appear, so the two traits are inherited independently.

Multiple Choice

Q48 Multiple Choice · 1 mark ★ Board ×2 2 papers

Two pea plants, one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds were crossed with each other which produced F1 progeny that have only round yellow (RrYy) seeds. When F1 plants are self-pollinated, the F2 progeny will have which new combination of characters, as compared to the parents?
(i) Round, yellow (ii) Round, green (iii) Wrinkled, yellow (iv) Wrinkled, green

(A) (i) and (ii)
(B) (i) and (iv)
(C) (ii) and (iv)
(D) (i) and (iii)

Source: CBSE 31/4/1 Q6 (also 31/4/2, 31/4/3) (2026) [F4, p.370] · CBSE 8DEFG 31/8/1 Q7, 31/8/2 Q1, 31/8/3 Q4 (2026) [F4, p.95]

✔ Answer
(B) (i) and (iv) – round yellow and wrinkled green were not present in either parent.

⚠ **Note** Asked in BOTH 2026 board exams. In the 31/8 sets option (C) reads '(iii) and (iv)'; the answer is (B) in every set. (31/8 sets: F4 p.95, 125, 159.)

Q49 Multiple Choice · 1 mark ★ Board ×1 1 paper

In an experiment to study independent inheritance of two separate traits: shape and colour of seeds, the ratio of the different combinations in F2 progeny would be

(A) 1 : 3
(B) 1 : 2 : 1
(C) 9 : 3 : 3 : 1
(D) 9 : 1 : 1 : 3

Source: CBSE 31/3/1 Q10, 31/3/3 Q9 (2024) [F1]

✔ Answer
(C) 9 : 3 : 3 : 1

Q50 Multiple Choice · 1 mark ★ Board ×1 1 paper

Round, green seeded pea plant (RRyy) was crossed with wrinkled, yellow seeded pea plant (rrYY), and F1 progeny is produced. All plants of F1 progeny will have:

(A) round and green seeds
(B) round and yellow seeds
(C) wrinkled and green seeds
(D) wrinkled and yellow seeds

Source: CBSE VI 31(B) LMNK2 Q6 (2026) [F1]

✔ Answer
(B) round and yellow seeds (RrYy)

Assertion-Reason

Q51 **Assertion–Reason · 1 mark ★** **1 paper**

Assertion (A): Mendel self-crossed F1-progeny to obtain F2-generation.
Reason (R): F1-progeny of a tall plant with round seeds and a dwarf plant with wrinkled seeds are all dwarf plants having wrinkled seeds.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: KVS Lucknow Pre-board Q9 (2025-26) [FM]

✔ Answer
(c) Assertion is true but Reason is false.
• F1 plants are all tall with round seeds (dominant traits). [1]

Short Answer

Q52 **Short Answer · 3 marks ★** **Board ×1** **1 paper**

In one of Mendelian experiments, when F1 generation pea plants with round yellow seeds were self-pollinated, pea seeds with the following combinations were obtained in F2 generation:
Seeds: Round yellow | Round green | Wrinkled yellow | Wrinkled green
Number: 800 | 275 | 268 | 90
Analyse the result and describe the mechanism of inheritance of traits which explains the above results.

Source: CBSE 31/1/2 Q32 (2025) [F2/F3/F9]

✔ Answer
• The numbers are close to 9 : 3 : 3 : 1 (800 : 275 : 268 : 90). [1]
• Round and yellow are dominant; F1 was RrYy. [½]
• Two new combinations (round green, wrinkled yellow) appear that were not in the parents. [½]
• So the gene for seed shape and the gene for seed colour are inherited independently of each other; each trait separately gives 3 : 1. [1]

⚠ **Note** Check: 800/90 ≈ 8.9, 275/90 ≈ 3.1, 268/90 ≈ 3.0 → about 9 : 3 : 3 : 1. ✔

Q53 **Short Answer · 3 marks ★** **Board ×1** **1 paper**

Use the following information for pea plants: Dominant allele for tall plants – T; recessive allele for short plants – t; dominant allele for purple flowers – P; recessive allele for white flowers – p.
(a) Perform a cross between pure plant dominant for both the traits with another plant which is recessive for both the traits and work out the progeny up to F2 generation.
(b) What is the probability of obtaining tall plants with white flowers in F2 progeny?

Source: CBSE 31/4/3 Q13 (2026) [F4, p.11]

✔ Answer
(a) TTPP × ttpp → gametes TP and tp → F1 all TtPp (tall, purple). [1]
F1 self-pollinated: gametes TP, Tp, tP, tp → F2 = 9 tall purple : 3 tall white : 3 short purple : 1 short white. [1]
(b) Tall white = 3/16. [1]

Q54 **Short Answer · 3 marks ★** **1 paper**

In a genetic experiment, plants with pure round green seeds (RRyy) were crossed with plants with wrinkled yellow seeds (rrYY).
(i) Show the gametes formed when F1 was self-pollinated.
(ii) A total of 144 seeds were produced which developed into saplings. Show the ratio in which these traits are independently inherited in these 144 saplings.

Source: CBSE Sample Question Paper 2025-26 Q14 (SQP 2025-26) [F8, p.306]

✔ Answer
(i) F1 is RrYy; its gametes are RY, Ry, rY, ry. [1]
(ii) F2 = 9 : 3 : 3 : 1 [1]
Round yellow = 9/16 × 144 = 81; round green = 27; wrinkled yellow = 27; wrinkled green = 9. [1]

⚠ **Note** Corrected key: the official marking scheme (F8 p.320) writes 'Tall round 81, Tall wrinkled 27, Short round 27, Short wrinkled 9'. The numbers are right but the traits are wrong – this cross is about seed shape and seed colour, not height.

Case / Source-based

Q55 **Case / Source-based · 4 marks ★★** **Board ×2** **3 papers**

In order to trace the inheritance of traits Mendel crossed pea plants having one contrasting character or a pair of contrasting characters. When he crossed pea plants having round and yellow seeds with pea plants having wrinkled and green seeds, he observed that no plants with wrinkled and green seeds were obtained in the F1 generation. When the F1 generation pea plants were cross-bred by self-pollination, the F2 generation had seeds with different combinations of shape and colour also.
(a) Write any two pairs of contrasting characteristics of pea plant used by Mendel other than those mentioned above. (1)
(b) Differentiate between dominant and recessive traits. (1)
(c) State the ratio of the combinations observed in the seeds of F2 generation (in the above case). What do you interpret from this result? (2)
OR (c) Given below is a cross between a pure violet flowered pea plant (VV) and a pure white flowered pea plant (vv). Diagrammatically explain what type of progeny is obtained in F1 generation and F2 generation. (2)

Source: CBSE 31/1/1 Q38, 31/1/2 Q38, 31/1/3 Q37 (2023) [F1] · CBSE VI 31(B)/S EFGH/S Q38 (yr?) [F1] · Practice paper case Q15 (SQP/practice) [F6]

✔ Answer
(a) Tall/short plant; violet/white flower. [½ + ½]
(b) Dominant – expressed in F1 even with one copy; recessive – hidden in F1, shows only when both copies are recessive. [1]
(c) Round yellow : round green : wrinkled yellow : wrinkled green = 9 : 3 : 3 : 1. [1] Seed shape and seed colour are inherited independently of each other. [1]
OR (c) VV × vv → F1 all Vv (violet). Vv × Vv → VV, Vv, Vv, vv → F2 = 3 violet : 1 white. [2]

⚠ **Note** Also asked as (EFGH/S VI): RRYY × rryy – method to get F2, new traits in F2, conclusion; OR 'a trait is inherited but may not be expressed – justify'. Practice paper: dominant traits seen in F1, why hidden traits reappear, F2 ratio.

Q56 Case / Source-based · 4 marks ★ 1 paper

Mendel kept a careful count of the plants showing each trait in every generation. He studied many pairs of contrasting characters in pea plants and, from his experiments, gave the laws of inheritance.
(a) A pure tall plant with round seeds is crossed with a pure short plant with wrinkled seeds. What will the F1 plants look like?
(b) Which traits are recessive in this cross?
(c) If the F1 plants are self-pollinated, name the kinds of plants that appear in F2 and give their ratio.
OR (c) If 1600 plants are obtained in F2, how many of them will be (i) tall with round seeds (ii) short with wrinkled seeds? What does this experiment show?

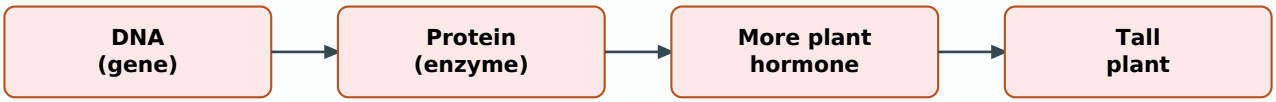
Source: Practice paper Q38 (SQP/practice) [F4, p.577]

✓ Answer
(a) TtRr – tall plants with round seeds. [1]
(b) Short height and wrinkled seed. [1]
(c) Gametes TR, Tr, tR, tr → F2: 9 tall round : 3 tall wrinkled : 3 short round : 1 short wrinkled. [2]
OR (c) Tall round = 9/16 × 1600 = 900; short wrinkled = 1/16 × 1600 = 100. The two traits are inherited independently. [2]

Genes, DNA, proteins and chromosome number

How traits are expressed and sex determination · NCERT 8.2.3 – 8.2.4 · 7 questions · Board appearances 5 · Prepared by Abhishek Das, TGT (Science)

Picture it



Gamete (half: 23) + gamete (23) → zygote (46). Fertilisation restores the chromosome number.

DNA → protein (enzyme) → trait. Tall plant: more efficient enzyme → more hormone → more height. Gametes carry half the chromosomes; fertilisation restores the full number.

Multiple Choice

Q57 Multiple Choice · 1 mark ★ Board ×1 1 paper

The statement that correctly describes the characteristic(s) of a gene is:

(a) In individuals of a given species, a specific gene is located on a particular chromosome.
(b) A gene is not the information source for making proteins in the cell.
(c) Each chromosome has only one gene located all along its length.
(d) All the inherited traits in human beings are not controlled by genes.

Source: CBSE 31/1/1 Q10, 31/1/2 Q10, 31/1/3 Q12 (2023) [F1]

✓ Answer
(a) In individuals of a given species, a specific gene is located on a particular chromosome.

Q58 **Multiple Choice · 1 mark ★** **Board ×1** **1 paper**

Which one of the given statements is incorrect:

(a) DNA has the complete information for a particular characteristic.
(b) DNA is the molecule responsible for the inheritance of characters from parents to offsprings.
(c) Change in information will produce a different protein.
(d) Characteristics will remain the same even if protein changes.

Source: CBSE 31/4/3 Q10 (2023) [F1]

✔ Answer
(d) Characteristics will remain the same even if protein changes.

Q59 **Multiple Choice · 1 mark ★** **Board ×1** **1 paper**

The number of chromosomes in parents and offsprings of a particular species undergoing sexual reproduction remain constant due to:

(a) doubling of chromosomes after zygote formation.
(b) halving of chromosomes after zygote formation.
(c) doubling of chromosomes before gamete formation.
(d) halving of chromosomes at the time of gamete formation.

Source: CBSE 31/4/1 Q12 (2023) [F1]

✔ Answer
(d) halving of chromosomes at the time of gamete formation.

Assertion-Reason

Q60 **Assertion-Reason · 1 mark ★** **1 paper**

Assertion: Height in pea plants is controlled by efficiency of enzymes and is thus genetically controlled.
Reason: Cellular DNA is the information source for making proteins in the cell.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: KVS Lucknow 1st Pre-board Q18 (yr?) [FM]

✔ Answer
(a) Both A and R are true and R is the correct explanation of A.
• DNA → protein (enzyme) → amount of plant hormone → height. [1]

Very Short Answer

Q61 Very Short Answer · 2 marks ★ Board ×1 1 paper

In a tobacco plant, the male gametes have twenty-four chromosomes. The number of chromosomes in the female gametes is also twenty-four. What is the number of chromosomes in the zygote produced? How is the chromosome number in the zygote re-established?

Source: CBSE 31/7/1 Q11(a), 31/7/2 Q10 (2026) [F4]

✔ Answer
• Zygote has 24 + 24 = 48 chromosomes. [1]
• Gametes have half the number of chromosomes; when a male and a female gamete fuse at fertilisation, the full number is restored in the zygote. [1]

Q62 Very Short Answer · 2 marks NEW

Explain with the example of height in pea plants how a gene controls a characteristic.

Source: NEW – practice question written in NCERT words (not from a past paper)

✔ Answer
• The gene for height gives information to make an enzyme that makes a plant hormone. [1]
• If the enzyme works efficiently, much hormone is made and the plant is tall; if the gene is changed and the enzyme is less efficient, less hormone is made and the plant is short. [1]

Long Answer

Q63 Long Answer · 5 marks ★ Board ×1 1 paper

Give reason for the following:
(a) During reproduction inheritance of different proteins will lead to altered body designs.
(e) The parents and off-springs of organisms reproducing sexually have the same number of chromosomes.
[(b)–(d) of this question are from Ch 7.]

Source: CBSE 31/6/2 Q36(a),(e) (2023) [9-compressed-1-64 OCR, p.25]

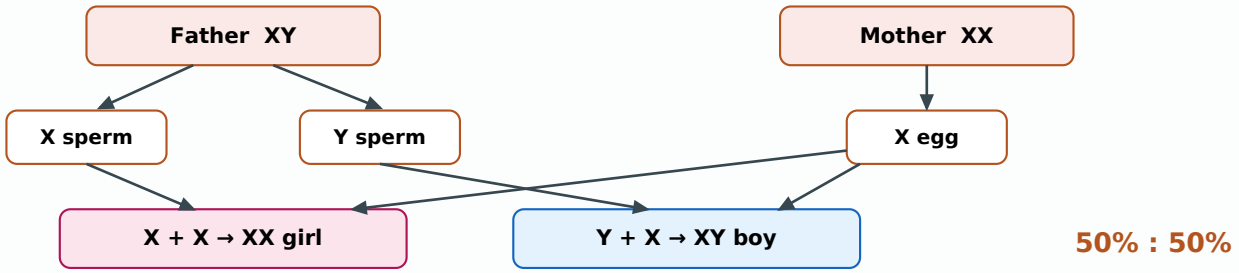
✔ Answer
(a) Proteins (enzymes) made from DNA information control body features; if a different protein is inherited, the body design changes. [1]
(e) Gametes are formed by a special division that halves the chromosome number; fusion of two gametes restores the original number in the zygote. [1]

⚠ **Note** Only parts (a) and (e) belong to Heredity (2 of 5 marks). Parts (b)–(d) are in the Ch 7 bank.

Sex determination

How traits are expressed and sex determination · NCERT 8.2.3 – 8.2.4 · 16 questions · Board appearances 13 · Prepared by Abhishek Das, TGT (Science)

Picture it



Mother XX gives only X eggs. Father XY gives X or Y sperms. X sperm + egg → girl (XX); Y sperm + egg → boy (XY). Chance of boy or girl = 50%. In some reptiles, temperature of eggs decides sex.

Multiple Choice

Q64 Multiple Choice · 1 mark ★ Board ×1 1 paper

When an 'X' bearing sperm fertilises the egg, the resulting zygote has the following combination of chromosomes:

(a) 44 + XX
(b) 44 + XY
(c) 22 + XX
(d) 22 + XY

Source: CBSE 31/2/1 Q12, 31/2/2 Q8, 31/2/3 Q10 (2023) [F1, p.186]

✔ Answer
(a) 44 + XX

Q65 Multiple Choice · 1 mark ★ Board ×1 1 paper

Sex determination depends upon the environment in

(A) Birds
(B) Amphibians
(C) Reptiles
(D) Fishes

Source: CBSE 31/3/3 Q12 (2024) [F1]

✔ Answer
(C) Reptiles – in some reptiles the temperature at which eggs are kept decides the sex.

Q66 Multiple Choice · 1 mark ★ 1 paper

Identify the genetic composition of a normal child who inherits X chromosome from father:

(a) XX
(b) XY
(c) XYY
(d) XO

Source: KVS Lucknow Pre-board I Q9 (2023-24) [FM]

✔ Answer
(a) XX

Q67 Multiple Choice · 1 mark ★ 1 paper

Consider the following statements:
(i) The sex of a child is determined by what it inherits from the mother.
(ii) The sex of a child is determined by what it inherits from the father.
(iii) The probability of having a male child is more than that of a female child.
(iv) The sex of a child is determined at the time of fertilisation when male and female gametes fuse to form a zygote.
The correct statements are:

(a) (i) and (iii)
(b) (ii) and (iv)
(c) (iii) and (iv)
(d) (i), (iii) and (iv)

Source: KVS Lucknow Monthly Oct Q3 (2024-25) [FM]

✔ Answer
(b) (ii) and (iv)

Assertion-Reason

Q68 Assertion-Reason · 1 mark ★ Board ×1 1 paper

Assertion (A): Genes inherited from the parents decide the sex of a child.
Reason (R): X chromosome in a male child is inherited from his father.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: CBSE 31/1/1 Q18, 31/1/2 Q19, 31/1/3 Q17 (2023) [F1]

✔ Answer
(c) (A) is true, but (R) is false.
• A male child gets Y from the father and X from the mother. [1]

Q69 Assertion-Reason · 1 mark ★ Board ×1 1 paper

Assertion (A): In humans, males play an important role in determining the sex of a child.
Reason (R): Males have two 'X' chromosomes.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: CBSE VI 31(B)/S CDBA/S Q18 (yr?) [F1]

✔ Answer
(C) Assertion (A) is true, but Reason (R) is false.
• Males have one X and one Y (XY). [1]

Q70 **Assertion–Reason · 1 mark ★** **Board ×1 1 paper**

Assertion (A): In human beings, males have 'XX' sex chromosomes and females have 'XY' sex chromosomes.
Reason (R): Sex of the child is determined at the time of fertilisation when male and female gamete fuse to form a zygote.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: CBSE 31/3/2 Q19 (2024) [F1]

✔ Answer
(D) (A) is false, but (R) is true.
• Males are XY and females are XX. [1]

⚠ **Note** OCR shows 'KX' – a scan error for 'XX'.

Q71 **Assertion–Reason · 1 mark ★** **Board ×1 1 paper**

Assertion (A): In some reptiles, the temperature at which the fertilized eggs are kept determines whether the egg will develop into a male or a female.
Reason (R): In human beings, the sex is determined genetically.

(A) Both A and R true, R explains A · (B) Both true, R does not explain A · (C) A true, R false · (D) A false, R true

Source: CBSE 31/7/1 Q9, 31/7/2 Q8 (2026) [F4]

✔ Answer
(B) Both A and R are true, but R is not the correct explanation of A. [1]

Very Short Answer

Q72 **Very Short Answer · 2 marks ★** **Board ×2 2 papers**

State one genetically different feature between sperms and eggs of humans. What is its consequence?

Source: CBSE BRH/1 Q7 (pre-2020) [Merged_OCR (F5 supplement), p.5] · CBSE 31/1/2 Q35(b) 'How is sperm genetically different from egg?' (in LA) (2023) [F1]

✔ Answer
• A sperm carries either an X or a Y chromosome; an egg always carries an X chromosome. [1]
• Consequence: the type of sperm that fertilises the egg decides whether the child is a boy or a girl. [1]

Q73 **Very Short Answer · 2 marks ★** **Board ×1 1 paper**

(b) In human beings, the probability of getting a male or a female child is 50%. Explain with the help of a flow diagram only.

Source: CBSE 31/3/1 Q23(b), 31/3/2 Q25(b), 31/3/3 Q22(b) (2024) [F1]

✔ Answer
Father XY → sperms X or Y; Mother XX → eggs X only. [1]
X sperm + X egg → XX (girl); Y sperm + X egg → XY (boy). Each sperm type is equally likely → 50% boy, 50% girl. [1]

Q74 **Very Short Answer · 2 marks ★** **1 paper**

Sex determination in humans happens through sex chromosomes. In order to determine whether an accident victim is male or female, which cells can be used and why?

Source: CBSE competency item (Heredity) Q18 (CFPQ) [F4]

✓ Answer
• Any body cell with a nucleus (e.g. white blood cells, cells from the hair root or skin). [1]
• Every such cell has the sex chromosomes – XX in a female and XY in a male. [1]

Short Answer

Q75 **Short Answer · 3 marks ★★** **Board ×2** **5 papers**

"The sex of the children in the human beings will be determined by what they inherit from their father." Explain / justify this statement.

Source: CBSE VI 31(B) LMNK2 Q10 (2 marks) (2026) [F1] · KVS Lucknow 1st Pre-board Q28 (2024-25) [FM] · KVS Lucknow Pre-board I Q34(a) (in LA) (2023-24) [FM] · CBSE BRH/2 31/2/1 Q19 – flow chart + which parent (pre-2020) [Merged_OCR (F5 supplement), p.47] · CBSE competency item Q9(d) 'Which parent determines sex?' (CFPQ) [F4]

✓ Answer
• Women have a perfect pair of sex chromosomes (XX); all eggs carry X. [1]
• Men have a mismatched pair (XY); half the sperms carry X and half carry Y. [1]
• If the egg is fertilised by an X-sperm the child is a girl (XX); by a Y-sperm, a boy (XY). So the father's sperm decides the sex. [1]

⚠ **Note** Board version (LMNK2) is 2 marks – give the XX/XY points and the X-sperm / Y-sperm result.

Long Answer

Q76 **Long Answer · 5 marks ★** **1 paper**

(a) "The sex of the children is determined by what they inherit from their father and not the mother." Justify this statement.
(b) Mendel crossed pure pea plant having purple flowers with pure pea plant bearing white coloured flowers.
i. Obtain the genotype ratio in F1 generation.
ii. What type of cross is it?
iii. Which is dominant trait in this case?
iv. Find the % of purple flowers in F2 generation obtained by self-pollination of F1 generation.

Source: KVS Lucknow Pre-board I Q34 (2023-24) [FM]

✓ Answer
(a) Mother XX → all eggs X; father XY → X or Y sperms; X-sperm → girl, Y-sperm → boy; so the father decides. [2]
(b) i. All Pp (100% heterozygous). [½] ii. Monohybrid cross. [½] iii. Purple flower. [1] iv. 75% purple. [1]

Case / Source-based

Q77 Case / Source-based · 4 marks ★ Board ×1 2 papers

The mechanism by which the sex of an individual is determined is called sex-determination. In human beings, sex of a newborn is genetically determined, whereas in some others it is not. There are 46 (23 pairs) chromosomes in human beings. Out of these, 44 (22 pairs) control the body characters and 2 (one pair) are known as sex chromosomes. The sex chromosomes are of two types – X chromosome and Y chromosome. At the time of fertilisation, depending upon which type of male gamete fuses with the female gamete, the sex of the newborn child is decided.
(a) What is the statistical probability of getting either a male or a female child? Justify your answer. (2)
(b) Out of male or female, which of them has a perfect pair of sex chromosomes? In case of a perfect pair, will the gametes produced be of the same kind or of a different kind? (1)
(c) (i) Name two animals whose sex is not genetically determined. Explain the process of their sex determination. (1+1)
OR (ii) With the help of a flowchart only, show how sex is genetically determined in human beings. (1+1)

Source: CBSE 31/1/2 & 31/1/3 (1GEFH) Q15 (2025) [F2/F3/F9] · KVS Delhi Pre-board II Q38 (2024-25) [FM]

✔ Answer
(a) 50% each. Father makes X and Y sperms in equal numbers; mother makes only X eggs; either sperm can fertilise the egg. [1 + 1]
(b) Female (XX); all her gametes (eggs) are of the same kind – they carry X. [½ + ½]
(c)(i) Some reptiles, e.g. turtle and lizard (snail changes sex). In some reptiles the temperature at which the fertilised eggs are kept decides whether the young ones will be male or female. [1 + 1]
OR (c)(ii) Parents XY × XX → gametes X, Y and X → XX (girl) and XY (boy) in 1 : 1. [2]

⚠ **Note** Other sets ask: (a) why the human sex-chromosome pair is a mismatched pair (Y is shorter than X) and (b) how the chromosome number is restored (fusion of two gametes). KVS Delhi asks: types of gametes in male (two – X and Y), number of autosomes (44 / 22 pairs), chance of a girl after three daughters (50%), and E (brown) dominant over e (blue) – ee gives blue eyes.

Q78 Case / Source-based · 4 marks ★ Board ×1 1 paper

All human chromosomes are not paired. Most human chromosomes have a maternal and a paternal copy, and we have 22 such pairs. But one pair called the sex chromosomes, is odd in not always being a perfect pair. Women have a perfect pair of sex chromosomes. But men have a mismatched pair in which one is normal sized while the other is a short one.
(a) In humans, how many chromosomes are present in a zygote and in each gamete?
(b) A few reptiles rely entirely on environmental cues for sex determination. Comment.
(c) "The sex of a child is a matter of chance and none of the parents are considered to be responsible for it." Justify it through flow chart only.
OR (c) Why do all the gametes formed in human females have an X chromosome?

Source: CBSE 31/6/2 Q39, 31/6/3 Q38 (2023) [9-compressed-1-64 OCR, p.31]

✔ Answer
(a) Zygote – 46; each gamete – 23. [1]
(b) In some reptiles the temperature at which the fertilised eggs are kept decides whether the young one will be male or female; genes do not decide it. [1]
(c) Father XY → X-sperm / Y-sperm; Mother XX → X-egg. X-sperm + X-egg → XX girl; Y-sperm + X-egg → XY boy. Which sperm reaches the egg is by chance. [2]
OR (c) Females have a perfect pair (XX); when gametes form, each egg gets one of the two X chromosomes, so every egg has X. [2]

Q79 **Case / Source-based · 4 marks** ★ **1 paper**

Sex determination is the method by which distinction between males and females is established in a species. The sex of an individual is determined by specific chromosomes called sex chromosomes or allosomes. The normal chromosomes other than the sex chromosomes are known as autosomes.
Q.1 In XX–XO type of sex determination – (A) females produce two different types of gametes (B) males produce two different types of gametes (C) females produce gametes with Y chromosome (D) males produce gametes with Y chromosome.
Q.2 A couple has six daughters. What is the possibility of their having a girl next time? (A) 10% (B) 50% (C) 90% (D) 100%
Q.3 Number of autosomes present in liver cells of a human female is (A) 22 autosomes (B) 23 autosomes (C) 22 pairs (D) 23 pairs
Q.4 XX–XO and XX–XY types of sex determination are examples of (A) male heterogamety (B) female heterogamety (C) male homogamety (D) none of these

Source: KVS Lucknow Pre-board (Set-1) Q39 (yr?) [FM]

✔ Answer
Q.1 (B) Q.2 (B) 50% Q.3 (C) 22 pairs Q.4 (A) male heterogamety [1 each]

⚠ **Note** XX–XO and 'heterogamety' are beyond the NCERT text – Q.2 and Q.3 are the useful parts for board.

Summary – sub-theme × question type

Sub-theme	MCQ	AR	VSA	SA	LA	CASE	Total	Board
Variation during reproduction	2	3	1	–	–	1	7	4
Inherited traits in human beings	3	1	–	1	–	1	6	2
Mendel's pea plant, dominant and recessive traits	3	3	2	1	–	–	9	4
Monohybrid cross – one pair of traits	11	–	4	6	2	2	25	13
Dihybrid cross – two pairs, independent inheritance	3	1	–	3	–	2	9	8
Genes, DNA, proteins and chromosome number	3	1	2	–	1	–	7	5
Sex determination	4	4	3	1	1	3	16	13
Total	29	13	12	12	4	9	79	49

Top 10 – revise the night before

1. Q75 (SA, 3 m, ★★) – "The sex of the children in the human beings will be determined by what they inherit from their father." Explain / justify this statement.

2. Q20 (VSA, 2 m, ★★) – What is meant by the terms (I) dominant, and (II) recessive traits? Explain.

3. Q46 (CASE, 4 m, ★★) – In one of his famous experiments of tracing the inheritance of traits when Mendel cross-pollinated a pure tall pea plant with a pure dwarf p

4. Q55 (CASE, 4 m, ★★) – In order to trace the inheritance of traits Mendel crossed pea plants having one contrasting character or a pair of contrasting characters.

5. Q23 (MCQ, 1 m, ★) – In a cross between two tall pea plants a few dwarf pea plants were also obtained in F1 generation. It is possible only if the gene combinati

6. Q48 (MCQ, 1 m, ★) – Two pea plants, one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds were crossed with each other which produced

7. Q72 (VSA, 2 m, ★) – State one genetically different feature between sperms and eggs of humans. What is its consequence?

8. Q11 (AR, 1 m, ★) – Assertion (A): In humans, if gene (B) is responsible for black eyes and gene (b) is responsible for brown eyes, then the colour of eyes of t

9. Q34 (VSA, 2 m, ★) – A blue colour flower plant denoted by BB is cross-bred with that of a white colour flower plant denoted by bb.

10. Q47 (CASE, 4 m, ★) – In a cross breeding pea plants with violet flowers and plants with white flowers the all offspring of F1 generation had violet flowers. When

CBSE Class X Science (086) · 2026-27 syllabus

Chapter 13 — Our Environment

Previous-year question bank with answers · built from the PYQ HUNT paper collection

Prepared by Abhishek Das, TGT (Science) · Science with Abhishek Sir

93	84	417	170
different papers gone through	papers had Ch 13 questions — included	Ch 13 question appearances found	unique questions after clubbing

What I went through

Kind of paper	Gone through	Included (had Ch 13)	Not included
CBSE board papers (main, supplementary, VI)	**32**	**31**	1
CBSE official (SQP, CFPQ, competency items)	**7**	**7**	0
KVS / KV / Sahodaya pre-boards and tests	**23**	**15**	8
Other sample and practice papers	**31**	**31**	0
Total	**93**	**84**	**9**

• **Files read:** all 9 project files (4,461 PDF pages), plus the OCR files for the pages that had no text (files 5, 6, 8 and 9). Files 2 and 3 are the same as pages 1–504 of file 9, so 3,453 pages are different; 3,234 of these have a text layer and were searched page by page. The pages that had no text layer have now been read from the new OCR files; only a handwritten answer script was skipped.
• **Sets of one exam** (e.g. 31/1/1, 31/1/2, 31/1/3) are counted as one paper; a paper that appears in two files is counted once.
• **Not included (9):** CBSE old paper (Series RLH, 31/1); KV Sitapur PT-2 2024-25; KVS Lucknow Monthly (Oct) 2024-25; KV Sitapur PT 2024; KV Sitapur PT-I 2023; KVS Lucknow PB-1 2022-23; KVS Lucknow PB-1 (year n.p.); KVS Lucknow Monthly Test; KV Sitapur PT-2 2025-26 — no Ch 13 question in them (periodic tests of other chapters).
• **Clubbing:** 417 appearances of Ch 13 questions → 170 unique questions (same question in different papers is kept once, with all its sources). 3 [NEW] questions were added for 5-mark and case practice. Total in this bank: **173**.

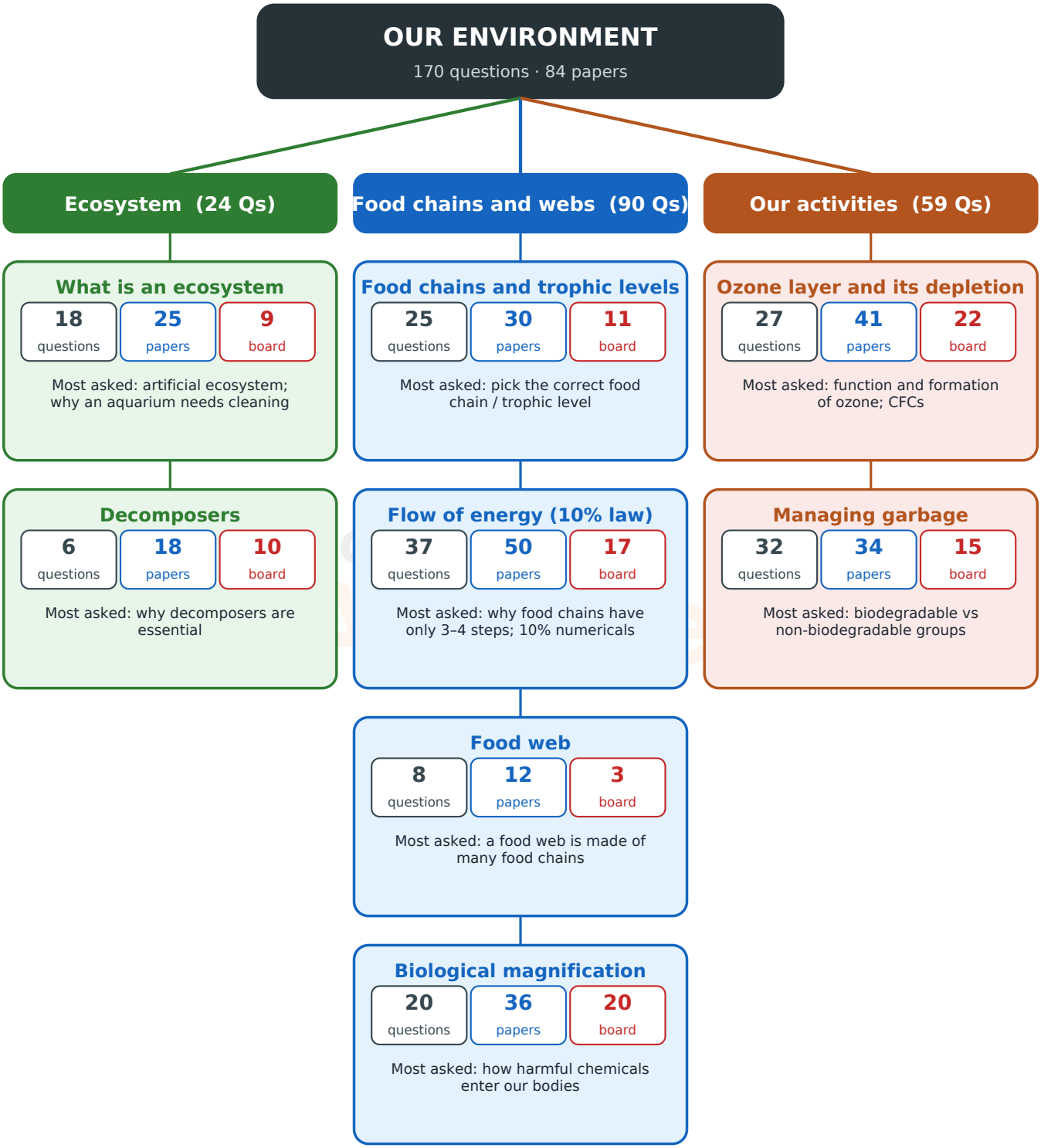
In this chapter

Chapter cover	p. 239	Concept map	p. 240
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What is an ecosystem — components	p. 243	Decomposers	p. 250
Food chains and trophic levels	p. 253	Flow of energy — 1% and 10% law	p. 262
Food web	p. 275	Biological magnification	p. 280
Ozone layer and its depletion	p. 289	Managing the garbage we produce	p. 298
Summary	p. 309		

How to read a question box: see page iv at the front of the book.

Concept map — questions clubbed by concept

Each box is one NCERT concept. The numbers show how many clubbed questions are in this bank and in how many different papers the concept was asked.



Key words to use in answers (NCERT): ecosystem, biotic, abiotic, producers, consumers, decomposers, trophic level, food chain, food web, 10 per cent, unidirectional, biological magnification, ozone, ultraviolet (UV) radiation, chlorofluorocarbons (CFCs), UNEP, biodegradable, non-biodegradable.

Theme map

Themes follow the NCERT (rationalised) section headings: 13.1 Eco-system — what are its components? · 13.1.1 Food chains and webs · 13.2 How do our activities affect the environment? (13.2.1 Ozone layer · 13.2.2 Managing the garbage we produce).

Theme	Sub-theme	NCERT section	Qs	Board-paper hits	Q nos.
T1 Ecosystem	**1A. What is an ecosystem — components; natural and artificial ecosystems**	13.1	18	9	Q1–Q18
T1 Ecosystem	**1B. Decomposers**	13.1	6	10	Q19–Q24
T2 Food chains and webs	**2A. Food chains and trophic levels**	13.1.1	25	13	Q25–Q49
T2 Food chains and webs	**2B. Flow of energy — 1% and 10% law (with numericals)**	13.1.1	37	21	Q50–Q86
T2 Food chains and webs	**2C. Food web**	13.1.1	8	3	Q87–Q94
T2 Food chains and webs	**2D. Biological magnification**	13.1.1	20	21	Q95–Q114
T3 How our activities affect the environment	**3A. Ozone layer and how it is getting depleted**	13.2.1	27	23	Q115–Q141
T3 How our activities affect the environment	**3B. Managing the garbage we produce**	13.2.2	32	19	Q142–Q173

Science with Abhishek Sir

Must-do page — the 20 most repeated questions

Ranked by number of CBSE board papers first, then by total papers. Learn these answers first.

#	Q no.	Question (short)	Type	Board	All papers
1	**Q111**	Explain how some harmful chemicals enter our bodies through the food chain. Why is the concentration of these harmful chemicals found to be maximum...	SA	10	10 ★★★
2	**Q23**	List two reasons to show that the existence of decomposers is essential in an ecosystem.	VSA	7	14 ★★★
3	**Q72**	Describe why food chains generally consist of a few steps.	VSA	4	6 ★★★
4	**Q134**	(a) Explain the role of UV radiation in the formation of ozone layer.	VSA	3	4 ★★
5	**Q12**	We do not clean ponds or lakes, but an aquarium needs to be cleaned regularly. Why?	VSA	3	3 ★★
6	**Q104**	Use of several pesticides which results in excessive accumulation of pesticides in rivers or ponds, is a matter of deep concern. Justify this state...	VSA	3	3 ★★
7	**Q139**	Write the essential function performed by ozone at the higher levels of the atmosphere. How is it formed in the upper atmosphere? Write the name of...	SA	2	7 ★★★
8	**Q103**	How do harmful chemicals get accumulated progressively at each trophic level in a food chain?	VSA	2	5 ★★
9	**Q133**	Why is damage to the ozone layer a cause for concern? What steps are being taken to limit this damage?	VSA	2	5 ★★
10	**Q162**	Define the terms biodegradable and non-biodegradable substance. Classify the following items into these two categories: Newspapers, Glass bottles, ...	VSA	2	4 ★★
11	**Q14**	"Although gardens are created by man but they are considered to be an ecosystem." Justify this statement.	VSA	2	2 ★
12	**Q77**	In a food chain, if 10,000 joules of energy is available to the producer, how much energy will be available to the secondary consumer to transfer i...	VSA	2	2 ★
13	**Q135**	"Ozone, although a deadly poison, performs an essential function for the life on the earth." Justify this statement.	VSA	2	2 ★
14	**Q136**	(i) State the essential function performed by ozone at the higher levels of the atmosphere.	VSA	2	2 ★
15	**Q25**	Select from the following, a food chain in which the organism of the second trophic level is missing:	MCQ	1	4 ★★
16	**Q50**	In an ecosystem, the amount of energy of sunlight captured by green plants to convert it into food energy is	MCQ	1	4 ★★
17	**Q51**	In an ecosystem, 10% of energy available for transfer from one trophic level to the next in a food chain is in the form of	MCQ	1	4 ★★
18	**Q52**	Consider the following food chain: Grass → Grasshopper → Frog → Snake → Eagle. If the amount of energy available at third trophic level is 50 kJ, t...	MCQ	1	4 ★★
19	**Q13**	What is meant by an artificial ecosystem? Give two examples of artificial ecosystems.	VSA	1	3 ★★
20	**Q26**	Why do green plants occupy the first trophic level of any food chain?	MCQ	1	3 ★★

Question bank with answers

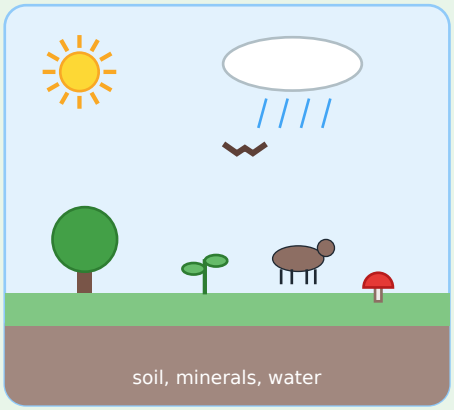
T1 Ecosystem

1A. What is an ecosystem — components; natural and artificial ecosystems

18 questions asked in **25** papers
9 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 1. Components of an ecosystem



BIOTIC (living)

- **Producers** — green plants, algae
- **Consumers** — herbivores, carnivores, omnivores, parasites
- **Decomposers** — bacteria, fungi

⇄

ABIOTIC (non-living)

- sunlight
- temperature
- rainfall
- wind
- soil
- minerals

Natural ecosystems

forest · pond · lake · grassland

Artificial (human-made) ecosystems

garden · crop field · aquarium

MCQ

Q1 **MCQ** · 1 mark ★★ — 3 papers

Which statement about a balanced ecosystem is NOT correct?
(A) Many food chains in it are linked with one another.
(B) Living organisms and their surroundings depend on each other.
(C) Animals depend on plants, but plants do not depend on animals.
(D) It has communities formed by populations of different organisms.

Source
Practice sample paper, set 1: Q16 [F4 p.568]
Practice sample paper, set 2: Q16 [F5 p.316]
Practice sample paper, set 4: Q16 [F5 p.354]

✔ Answer
(C) Plants also depend on animals (e.g. for pollination, and decomposers return nutrients to the soil), so "plants are not dependent on animals" is wrong.

Q2 MCQ · 1 mark ★ Board ×1 1 paper

An ecosystem contains maximum number of

(A) Producers (B) Herbivores
(C) Carnivores (D) Omnivores

Source
CBSE 2026: 31/5/3 Q3 [F4 p.526]

✔ Answer
(A) Producers — the first trophic level has the largest number of organisms; energy (and numbers) keep decreasing at each higher level.

Q3 MCQ · 1 mark ★ 1 paper

Which one of the following is not a natural ecosystem?

(a) Cropland ecosystem (b) Forest ecosystem
(c) Grassland ecosystem (d) Pond ecosystem

Source
Practice paper [F6 p.430]: Q5 [F6 p.430]

✔ Answer
(a) Cropland ecosystem — crop fields are human-made (artificial) ecosystems.

Q4 MCQ · 1 mark ★ 1 paper

Which of the following is/are terrestrial ecosystem(s)? A. Forest B. Aquarium C. Grassland D. Desert

Source
Practice paper [F6 p.399]: Q5 [F6 p.399]

✔ Answer
A, C and D — forest, grassland and desert are on land; an aquarium is a human-made water (aquatic) ecosystem.

Q5 MCQ · 1 mark ★ 1 paper

Which statement shows the interaction of an abiotic component with a biotic component in an ecosystem?

(a) A grasshopper feeding on a leaf. (b) Rainwater running down a lake.
(c) An earthworm making a burrow in the soil. (d) Mice fighting among themselves for food.

Source
Bangalore Sahodaya PB 2023-24: Q16 [F5 p.528]

✔ Answer
(c) An earthworm (biotic) making a burrow in the soil (abiotic). (a) and (d) are biotic–biotic; (b) is abiotic–abiotic.

Q6 **MCQ** · 1 mark ★ 1 paper

Given below are some biotic and abiotic components of an ecosystem: rock, rainfall, sunlight, mango tree, rabbit. Which of these components can continue to exist in the absence of the other component/s?

A. Only sunlight
B. Only rock and sunlight
C. Only mango tree and rabbit
D. Only rock, sunlight and rainfall

Source
CBSE CFPQ (Competency Focused Practice Qs): Q76 [F6 p.50]

✔ Answer
D. Only rock, sunlight and rainfall — non-living (abiotic) components do not depend on living ones; the mango tree needs sunlight and rain, the rabbit needs the tree. (Official CFPQ key kept.)

Q7 **MCQ** · 1 mark ★ 1 paper

An ecosystem is represented in the figure given above (A = animals such as the frog and butterfly; B = plants). This ecosystem will be self-sustaining if:
a) the type of organisms represented by B are eliminated
b) materials cycle between the organisms labelled A and organisms labelled B
c) organisms labelled A outnumber the organisms labelled B
d) the organisms labelled A are equal in number to the organisms labelled B.

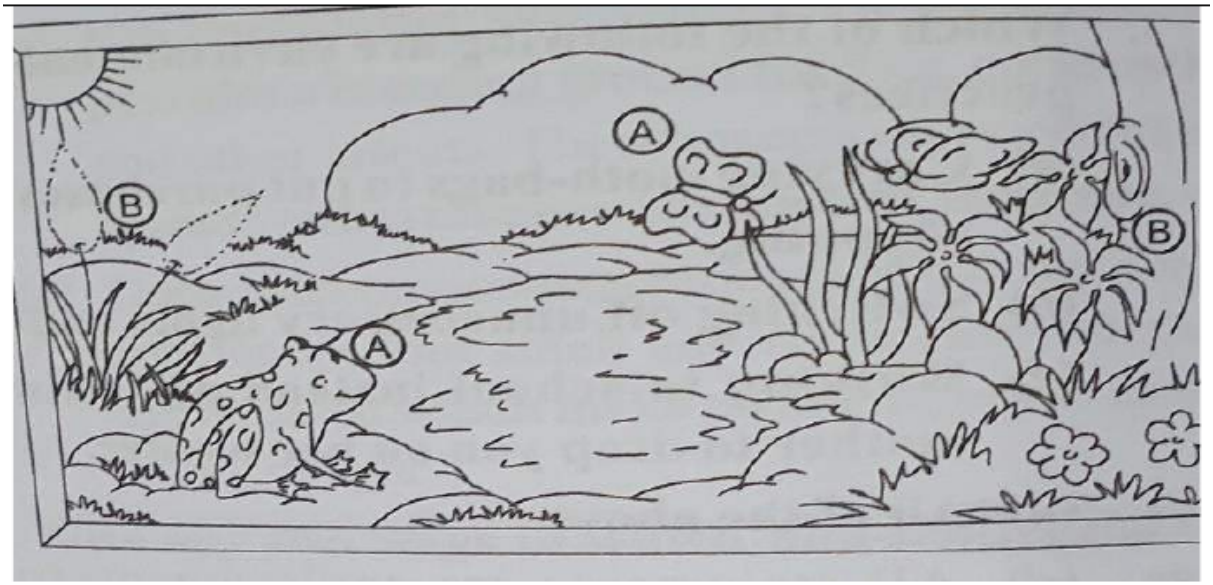


Figure from the question paper.

Source
Bangalore Sahodaya PB-1 2024-25: Q15 [F5 p.16]

✔ Answer
b) materials cycle between the organisms labelled A (animals) and B (plants) — nutrients must keep cycling for the ecosystem to sustain itself.

Assertion–Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q8 **Assertion–Reason** · 1 mark ★★ 3 papers

Assertion (A): Ecology is the study of how living organisms interact with their surroundings.
Reason (R): The living organisms of an area and its non-living surroundings work together as an ecosystem.

Source
Practice sample paper, set 3: Q20 [F4 p.603]
Practice sample paper, set 5: Q20 [F4 p.637]
Practice paper [F8 p.82]: Q20 [F8 p.85]

✔ Answer
(B) Both statements are true, but R describes an ecosystem; it does not explain the meaning of ecology.

Q9 **Assertion–Reason** · 1 mark ★ Board ×1 2 papers

Assertion (A): An ecosystem consists of biotic components and abiotic components.
Reason (R): Biotic and abiotic components play important roles for the sustenance of life and work independently in all ecosystems.

Source
CBSE 2023: 31/6/2 Q18 [F9 p.15]
Practice paper [F8 p.34]: Q20 [F8 p.37]

✔ Answer
(C) A is true, R is false — biotic and abiotic components interact with each other; they do not work independently. [Source key gave (a): corrected.]

Q10 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): The organisms of an ecosystem depend on one another.
Reason (R): Green plants prepare their own food by photosynthesis.

Source
Practice sample paper, set 6: Q14 [F4 p.556]

✔ Answer
(B) Both true; R tells how producers get food, it does not explain why all organisms depend on each other.

Q11 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Biotic components of ecosystem continuously require energy to carry on life processes.
Reason (R): Abiotic components are the non-living factors of the ecosystem.

Source
Practice paper [F6 p.399]: Q9 [F6 p.400]

✔ Answer
(B) Both are true, but R (definition of abiotic components) does not explain A.

Very Short Answer

Q12 **Very Short Answer** · 2 marks ★★ Board ×3 3 papers

We do not clean ponds or lakes, but an aquarium needs to be cleaned regularly. Why?

Source
CBSE 2023: 31/2/1 Q26 [F1 p.192]
CBSE VI 31(B) (ZWYX/5) (yr?): Q33 [F9 p.112]
CBSE old paper (Series RSH/1, 31/1/1) (pre-2020, yr?): Q19 [F6 p.112]
NCERT: NCERT Activity 13.1 (think about the aquarium)
Also asked as:
• VI (ZWYX) Q33 (3 marks): "Define the term ecosystem. List its two main components. We do not clean natural ponds or lakes, but an aquarium needs to be cleaned regularly. Why?" — add: ecosystem = all the interacting organisms in an area together with the non-living constituents of the environment (1); components: biotic and abiotic (1).
• Old CBSE (RSH/1) Q19 (3 marks): "(a) What is an ecosystem? List its two main components. (b) We do not clean ponds or lakes, but an aquarium needs to be cleaned regularly. Explain."

✔ Answer
• A pond/lake is a natural, self-sustaining ecosystem: decomposers (bacteria and fungi) break down dead remains and wastes and return nutrients (½+½).
• An aquarium is an artificial ecosystem with few or no decomposers and no complete food chain, so wastes and left-over food collect and must be removed by us (½+½).

Q13 **Very Short Answer** · 2 marks ★★ Board ×1 3 papers

What is meant by an artificial ecosystem? Give two examples of artificial ecosystems.

Source
CBSE 2022 Term-II: 31/1/1 Q7 [F9 p.170]; 31/1/2 Q1 [F9 p.211]; 31/1/3 Q6 [F9 p.256]
Practice paper [F6 p.383]: Q11 [F6 p.384]
Practice paper [F6 p.430]: Q11 [F6 p.431]
Also asked as:
• CBSE 2022 T-II Q7(b): "List two human-made ecosystems."
• Practice paper: "What is an ecosystem? Give one example each of (i) natural, and (ii) man-made ecosystem." — natural: forest/pond/lake; man-made: garden/crop field/aquarium.

✔ Answer
• Ecosystems made by human beings are called artificial (human-made) ecosystems (1).
• Examples: garden, crop field, aquarium (any two) (½+½).

Q14 **Very Short Answer** · 2 marks ★ Board ×2 2 papers

"Although gardens are created by man but they are considered to be an ecosystem." Justify this statement.

Source
CBSE 2023: 31/4/3 Q25 [F1 p.442]
CBSE Suppl. (yr?): 31/S/3 Q26 [F4 p.309]
Also asked as:
• Suppl. 31/S/3 Q26: "Explain why a garden is called an ecosystem."

✔ Answer
• An ecosystem is made of all the interacting organisms in an area together with the non-living constituents of the environment (1).
• In a garden, biotic components (grass, trees, flowers, insects, birds, frogs, earthworms, decomposers) interact with abiotic components (soil, water, air, sunlight, temperature); so it is an (artificial) ecosystem (1).

Q15 **Very Short Answer** · 2 marks ★ 1 paper

Would you consider any one group of organisms in the ecosystem to be of primary importance? Why or why not?

Source
Sample Question Paper-16 (Class X, 2024-25): Q26 [F8 p.131–303]

✓ Answer
• No single group can live alone — producers, consumers and decomposers all depend on one another (1).
• Still, producers (green plants) may be called most important: they alone make food from sunlight, and all other organisms depend on them directly or indirectly for energy (1).

Short Answer

Q16 **Short Answer** · 3 marks ★ Board ×1 2 papers

(i) Why is a kitchen garden called an artificial ecosystem while a forest is considered to be a natural ecosystem?
(ii) While designing an artificial ecosystem at home, write any two things to be kept in mind to convert it into a self-sustaining system. Give reason to justify your answer.

Source
CBSE 2023: 31/1/1 Q33 [F1 p.104]; 31/1/2 Q27 [F1 p.134]; 31/1/3 Q32 [F1 p.168]
Practice paper [F6 p.273]: Q10 [F6 p.274]; Q10 [F6 p.282]

✓ Answer
(i) A kitchen garden is made and looked after by human beings (plants chosen, watered, weeded) — artificial; a forest develops and runs on its own without human help — natural (1).
(ii) • Include producers, consumers and decomposers so that a complete food chain exists (1).
• Keep the right balance of biotic and abiotic factors (light, water, air) so nutrients are recycled and energy keeps flowing (1).

⚠ **Note:** In all 2023 (31/1) sets this is the (a) part; the OR part is the Hawk–snake–plants–rat numerical (see B11).

Q17 **Short Answer** · 3 marks ★ 1 paper

A terrarium contains soil and a variety of plants inside a glass container. It is watered and sealed. The soil gives the required nutrients, and plants use the carbon dioxide present in the air inside the container to prepare food using sunlight.
(a) Can this terrarium be called an ecosystem? Give a reason.
(b) List the biotic and abiotic components of this ecosystem.

Source
CBSE CFPQ (Competency Focused Practice Qs): Q136 [F6 p.64]

✓ Answer
(a) Yes — living and non-living components in it are interacting with each other (1).
(b) Biotic: plants, micro-organisms/decomposers in the soil (1). Abiotic: soil, water, air (CO_2), sunlight, temperature (1).

Case / Source-based

Q18 **Case / Source-based** · 4 marks NEW

[NEW] Rohan set up an aquarium with water plants, small fish and snails. After two weeks the water turned dirty and smelly. His teacher said a pond near the school never needs cleaning. (a) Name one biotic and one abiotic component of the aquarium. (b) Is the aquarium a natural or an artificial ecosystem? (c) Why does the aquarium need cleaning while the pond does not?

Source [NEW] — gap-filler, not from a paper.

✓ Answer

(a) Biotic: plants/fish/snails; abiotic: water/light/air (1).
(b) Artificial (human-made) ecosystem (1).
(c) The pond has decomposers and complete food chains that break down wastes and recycle nutrients; the aquarium lacks enough decomposers, so wastes collect (2).

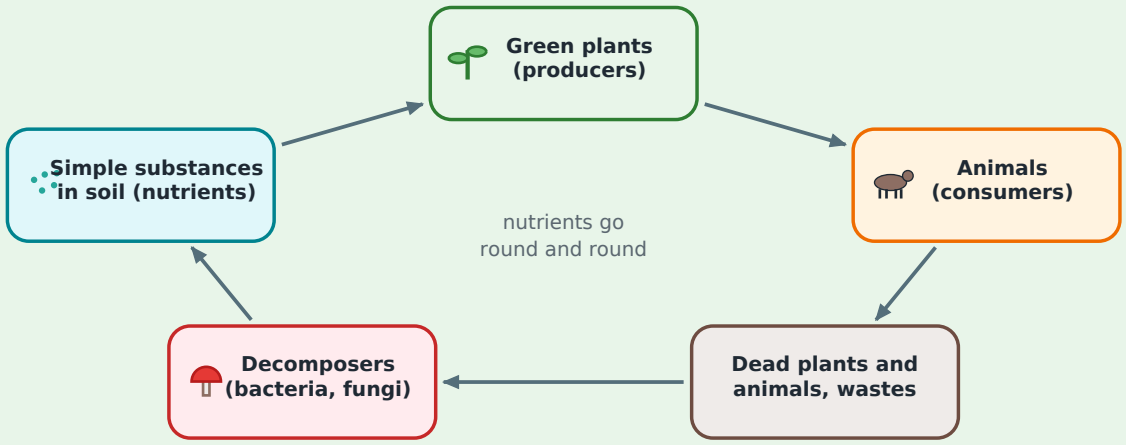
T1 Ecosystem

1B. Decomposers

6 questions asked in **18** papers
10 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 2. Decomposers recycle nutrients (and keep the surroundings clean)



MCQ

Q19 MCQ · 1 mark ★ Board ×1 1 paper

Decomposers play an important role in the nature. Which role do they not perform?
(A) Convert simple inorganic substances into complex organic substances using radiant energy of the Sun.
(B) Act on the garbage and reduce it.
(C) Natural replenishment of the soil.
(D) Breakdown of complex organic matter of dead animals and plants into simple form.

Source
CBSE 2026 VI 31(B) (LMNK2): Q5 [F1 p.61]

✓ Answer
(A) Converting simple inorganic substances into complex organic substances using sunlight is done by producers (green plants), not decomposers.

Q20 MCQ · 1 mark ★ Board ×1 1 paper

In an ecosystem, the decomposers perform an important role. Select the option indicating the role of decomposers.
(A) Convert inorganic materials to simpler forms
(B) Break down complex organic substances to simple inorganic substances.
(C) Break down inorganic substances into organic substances.
(D) Do not act on organic compounds.

Source
CBSE 2026: 31/5/1 Q7 [F4 p.464]

✓ Answer
(B) They break down complex organic substances into simple inorganic substances.

Q21 MCQ · 1 mark ★ 1 paper

Which of the following is not a role of decomposers in the ecosystem?

A. Natural replenishment of soil.
B. Enrichment of oxygen in atmosphere.
C. Waste decomposition.
D. Break-down of dead remains.

Source
CBSE SQP 2024-25: Q16 [F6 p.448]

✔ Answer
B. Enrichment of oxygen in atmosphere — decomposers do not add oxygen; green plants do. (Official SQP key.)

Assertion–Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q22 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): Decomposers help in recycling of nutrients between living and non-living components of ecosystem.
Reason (R): Decomposers help in decomposing dead bodies of organisms and return various nutrient elements to their source viz soil, water and air.

Source
Practice paper [F8 p.50]: Q20 [F8 p.53]

✔ Answer
(A) R explains how decomposers recycle nutrients.

Very Short Answer

Q23 **Very Short Answer** · 2 marks ★★★ Board ×7 14 papers

List two reasons to show that the existence of decomposers is essential in an ecosystem.

Source
CBSE 2023: 31/1/2 Q21 [F1 p.130]
CBSE 2024: 31/3/1 Q26 [F1 p.275]
CBSE 2026: 31/4/3 Q10 [F4 p.436]
CBSE 2026: 31/7/3 Q11 [F4 p.70]
CBSE 2026: 31/8/3 Q14 [F4 p.163]
CBSE 2022 Term-II: 31/1/1 Q13 [F9 p.174]; 31/1/2 Q8 [F9 p.215]; 31/1/3 Q12 [F9 p.258]
CBSE old paper (Series BRH/1, 31/1/1) (pre-2020, yr?): Q4 [F5 p.497]
KVS Raipur PB-2 2025-26: Q31 [F5 p.301]; Q31 [F5 p.307]
Practice paper [F6 p.414]: Q11 [F6 p.415]
Practice paper [F6 p.474]: Q25 [F6 p.477]; Q25 [F6 p.483]
Practice paper [F6 p.490]: Q25 [F6 p.494]; Q25 [F8 p.5]
Practice paper [F8 p.50]: Q25 [F8 p.53]
Practice paper [F6 p.257]: Q11 [F6 p.258]; Q11 [F6 p.290]
Practice sample paper, set 7: Q33 [F4 p.672]
NCERT: NCERT in-text: "What is the role of decomposers in the ecosystem?"
Also asked as:
• 2024 (31/3/1) Q26: "What are decomposers? List two consequences of their absence in an ecosystem."
• 2026 (31/4/3) Q10: "What are decomposers? List two important roles they play in the environment."
• 2026 (31/7/3) Q11(a): "What will be the impact on an ecosystem if all the bacteria, fungi or microorganisms are removed from the environment?"
• 2026 (31/8/3) Q14(A): "If no decomposers in an ecosystem, what will happen to the garbage and dead animal and plant wastes?"
• 2022 T-II Q13(c): "State one ill-effect of the absence of decomposers from a natural ecosystem."
• KVS Raipur PB-2 2025-26 Q31 (3 marks): "Why are bacteria and fungi called decomposers? List any two advantages of decomposers to the environment."
• Practice papers: "What would happen if all the microorganisms are removed from the environment?"; "Microorganisms are often referred to as the scavengers of the environment. Explain."
• Old CBSE (BRH/1) Q4 (1 mark): "Bacteria and fungi are called decomposers. Why?" → they break down the complex organic substances of dead plants and animals into simple inorganic substances.

✔ Answer
• Decomposers (bacteria, fungi) break down the complex organic substances of dead plants and animals into simple inorganic substances that go into the soil — natural replenishment of the soil (1).
• They act on garbage/dead remains and clean the environment; without them dead bodies and wastes would pile up and nutrients would not be recycled (1).

Short Answer

Q24 **Short Answer** · 3 marks ★ Board ×1 1 paper

(a) What are decomposers? Explain how the decomposers (i) keep the environment clean, and also (ii) replenish the soil nutrients.

Source
CBSE VI 31(B) (code 11-31(B)) (yr?): Q33 [F9 p.141]

✔ Answer
• Micro-organisms such as bacteria and fungi that break down the dead remains and waste products of organisms are decomposers (1).
(i) They break down dead bodies, garbage and waste products, so these do not pile up — the environment stays clean (1).
(ii) They break the complex organic substances into simple inorganic substances which go into the soil and are used again by plants (1).

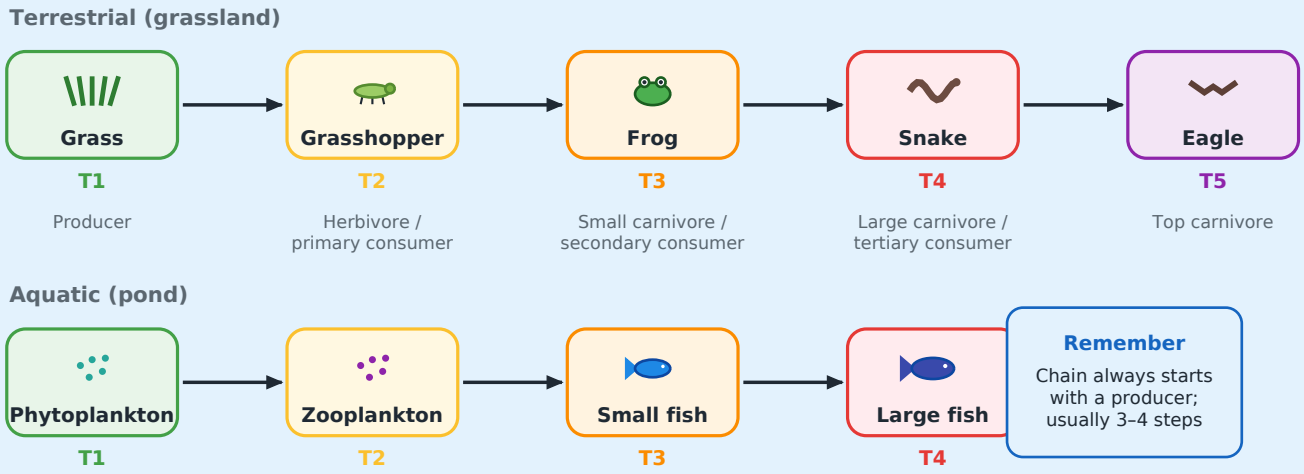
T2 Food chains and webs

2A. Food chains and trophic levels

25 questions asked in **30** papers
11 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 3. Food chains and trophic levels (arrow = "is eaten by")



MCQ

Q25 MCQ · 1 mark ★★ Board ×1 4 papers

Select from the following, a food chain in which the organism of the second trophic level is missing:

(A) small fish, zooplankton, phytoplankton, large fish
(B) frog, snake, grass, grasshopper, eagle
(C) grass, frog, tiger, snake
(D) grass, goat, lion

Source
CBSE Suppl. VI 31(B)/S (EFGH/S) (yr?): Q16 [F1 p.38]
KVS Ahmedabad PB 2025-26: Q7 [F9 p.505]; Q2 [F9 p.517]
KVS Lucknow PB-2 2024-25: Q7 [FM p.21]
Practice paper [F6 p.369]: Q7 [F6 p.370]

✓ Answer
(C) Arranged, it is grass → frog → snake → tiger; the herbivore (e.g. grasshopper) that should come between grass and frog is missing.

⚠ **Note:** Other papers print the same four chains in a different order; mark the chain "Tiger, grass, snake, frog".

Q26 MCQ · 1 mark ★★ Board ×1 3 papers

Why do green plants occupy the first trophic level of any food chain?
(A) They are fixed at one place in the soil so they cannot move from place to place.
(B) They are widely distributed.
(C) There are more herbivores than carnivores.
(D) They have the ability to make food using sunlight, by photosynthesis.

Source
CBSE 2026 VI 31(B) (LMNK2): Q4 [F1 p.59]
KVS Lucknow Set-1 (year n.p.): Q10 [FM p.48]
Sample Case Studies (Class X): Q7 [F6 p.249]

✓ Answer
(D) They have the ability to make food using sunlight, by photosynthesis (they are producers).

Q27 MCQ · 1 mark ★★ Board ×1 3 papers

In terms of various trophic levels of a food chain, which of the following organisms belong to the same level?
(A) Snake and Grasshopper
(B) Grass and tree
(C) Lizard and elephant
(D) Bacteria and grass

Source
CBSE 2026: 31/4/2 Q6 [F4 p.402]
Practice paper [F8 p.50]: Q15 [F8 p.52]
Sample Question Paper-11 (Class X, 2024-25): Q15 [F8 p.131–303]
Also asked as:
• Practice paper: "Which of the following organisms belong to the same trophic level? Plant, snake, insect, frog, hawk, deer" — Frog and snake are shown as the same level in that key; this is true only in a chain like grass → deer/insect → frog/snake. Discuss with students.
• Sample Question Paper-11 Q15: "Which of the following belongs to the same trophic level in a food chain? Eagle, Grass, Deer, Rabbit, Lion — (a) Grass and Deer (b) Rabbit and Eagle (c) Eagle and Deer (d) Deer and Rabbit" → (d) both are herbivores.

✓ Answer
(B) Grass and tree — both are producers (first trophic level).

Q28 MCQ · 1 mark ★ Board ×1 2 papers

Which of the following groups do not constitute a food chain?
(i) Wolf, rabbit, grass, lion
(ii) Plankton, man, grasshopper, fish
(iii) Hawk, grass, snake, grasshopper, frog
(iv) Grass, snake, wolf, tiger
(A) (i) and (iv)
(B) (i) and (iii)
(C) (ii) and (iii)
(D) (ii) and (iv)

Source
CBSE 2025: 31/1/1 Q15 [F9 p.192]; 31/1/2 Q16 [F9 p.235]; 31/1/3 Q14 [F9 p.276]
Practice paper [F8 p.34]: Q16 [F8 p.36]

✓ Answer
(D) (ii) and (iv). (i) grass → rabbit → wolf → lion and (iii) grass → grasshopper → frog → snake → hawk are proper chains; in (ii) the grasshopper does not fit, in (iv) snake does not eat grass.

Q29 MCQ · 1 mark ★ 2 papers

Which of the following group of organisms are not included in the ecological food chain?

(a) Carnivores (b) Herbivores
(c) Saprophytes (d) Predators

Source
Sample Case Studies (Class X): Q11.5 [F6 p.254]
Sample Question Paper-16 (Class X, 2024-25): Q15 [F8 p.131–303]

✔ Answer
Saprophytes — they (decomposers) feed on the dead remains of organisms of every level, so they are not placed at any one trophic level of a food chain.

⚠ **Note:** Option letters differ between papers: (c) in Sample Question Paper-16; (b) in the Sample Case Studies set.

Q30 MCQ · 1 mark ★ Board ×1 1 paper

Examine the given food chains to establish the correct one in an ecosystem:

(A) Seed → mouse → snake → deer (B) Algae → small fish → large fish → hawk
(C) Grasshopper → frog → snake → elephant (D) Plants → rabbit → deer → wolf

Source
CBSE 2026: 31/8/1 Q4 [F4 p.93]; 31/8/2 Q2 [F4 p.125]; 31/8/3 Q7 [F4 p.161]

✔ Answer
(B) Algae → small fish → large fish → hawk: every step is a real "who eats whom" link. (A) a deer does not eat snakes; (C) an elephant does not eat snakes; (D) a deer does not eat rabbits.

Q31 MCQ · 1 mark ★ Board ×1 1 paper

The organism occupying the fourth trophic level in a food chain operating in grassland is

(A) Green plants (B) Frog
(C) Grasshopper (D) Snake

Source
CBSE Suppl. EFGH/S (yr?): 31/S/1 Q15 [F4 p.220]; 31/S/2 Q12 [F4 p.278]; 31/S/3 Q15 [F4 p.332]

✔ Answer
(D) Snake — grass (1) → grasshopper (2) → frog (3) → snake (4).

Q32 MCQ · 1 mark ★ Board ×1 1 paper

Consider the following statements:
I. Every step in a food chain is called a trophic level.
II. Decomposers convert complex inorganic matter in dead remains of organisms into simple substances that go into the soil.
III. In a food chain, energy level increases from lower trophic level to higher trophic level.
IV. Linkages between various food chains constitute a food web.
The correct statements is/are

Source
CBSE Suppl. (yr?): 31/S/1 Q15 [F4 p.193]; 31/S/3 Q16 [F4 p.305]

✓ Answer
Statements I and IV only. II is wrong (decomposers break complex ORGANIC matter); III is wrong (energy decreases up the chain).

⚠ **Note:** Options are partly unreadable in the OCR copy; answer given as the statements.

Q33 MCQ · 1 mark ★ 1 paper

Which of the following is a logical sequence of food chain

(a) producer → consumer → decomposer
(b) producer → decomposer → consumer
(c) consumer → producer → decomposer
(d) decomposer → producer → consumer

Source
KVS Lucknow Set-1 (year n.p.): Q14 [FM p.48]

✓ Answer
(a) producer → consumer → decomposer.

Q34 MCQ · 1 mark ★ 1 paper

What will happen if the deer are missing in the following food chain? Grass → Deer → Tiger

Source
Practice paper [F6 p.305]: Q5 [F6 p.306]

✓ Answer
The population of tiger will decrease and the population of grass will increase — a missing link upsets the balance of the ecosystem.

Q35 MCQ · 1 mark

Which of the following constitute a food chain?

(a) Grass, wheat and mango
(b) Grass, goat and human
(c) Goat, cow and elephant
(d) Grass, fish and goat

Source
NCERT: NCERT Exercise Q2

✓ Answer
(b) Grass, goat and human.

Assertion–Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q36 Assertion–Reason · 1 mark ★ Board ×1 2 papers

Assertion (A): Producers are capable of using light energy from the sun to make food available in an ecosystem.
Reason (R): All food chains in an ecosystem start with a producer.

Source
CBSE 2024: 31/3/3 Q20 [F1 p.337]
Practice paper [F6 p.305]: Q9 [F6 p.306]

✓ Answer
(B) Both are true, but R does not explain why producers can use light energy (chlorophyll/photosynthesis).

Q37 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): The second trophic level of a food chain operating in a grassland is mostly occupied by a carnivore.
Reason (R): Carnivores feed upon herbivores and are secondary consumers.

Source
Practice paper [F6 p.474]: Q20 [F6 p.477]

✓ Answer
(D) A is false — the second trophic level is occupied by herbivores (primary consumers); R is true.

Q38 Assertion–Reason · 1 mark ★ 1 paper

Assertion (A): If the lions are removed from a food chain it will not affect the food chain, however if the plants are removed from a food chain it will disturb the ecosystem.
Reason (R): Plants are producers who can make food using sunlight, while lions are consumers.

Source
CBSE SQP 2024-25: Q20 [F6 p.449]

✓ Answer
(D) A is false — removing any trophic level (even lions) disturbs the food chain (herbivores increase, plants decrease); R is true. (Official SQP key.)

Very Short Answer

Q39 **Very Short Answer** · 2 marks ★ Board ×1 2 papers

(a) What is meant by trophic level?
(b) On an average, what percentage of energy is transferred to the second trophic level from the first trophic level? Which categories of consumers do the organisms of the second trophic level belong to?

Source
CBSE 2023: 31/2/2 Q26 [F1 p.219]
Practice paper [F6 p.305]: Q11 [F6 p.306]
NCERT: NCERT in-text: "What are trophic levels? Give an example of a food chain and state the different trophic levels in it."

✓ Answer
(a) Each step or level of the food chain forms a trophic level (1).
(b) About 10% (½); herbivores or primary consumers (½).

Q40 **Very Short Answer** · 1 mark ★ Board ×1 2 papers

What will happen if we kill all the organisms in one trophic level?

Source
CBSE old paper (Series RHB/1, 31/1/1) (pre-2020, yr?): Q3 [F6 p.169]
Practice paper [F8 p.67]: Q25 [F8 p.70]

✓ Answer
The food chain will break: organisms of the next (higher) level will not get food and will die, and organisms of the lower level will increase in number — the balance of the ecosystem is disturbed (1).

Q41 **Very Short Answer** · 2 marks ★ 2 papers

Create a food web comprising two separate food chains with different producers by using the data: rabbit, frog, grass, fish, fox, water insects, zebra, peacock, snake, trees, bird, owl, insects, tiger, vulture, duck.

Source
CBSE SQP 2025-26 (copy): Q12 [F5 p.284]; Q12 [F6 p.228]; Q12 [F8 p.306]
ALLEN Sample Paper 2025-26: Q12 [F8 p.334–349]

✓ Answer
Tree food chain: tree → zebra → tiger (any other) (½); grassland food chain: grass → zebra → tiger (½); food web: join the two chains at a common organism (zebra) (1). (Official SQP key.)

Q42 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Write an aquatic food chain with four trophic levels. Name the primary and tertiary consumer present in this food chain.

Source
CBSE Suppl. (yr?): 31/S/2 Q26 [F4 p.255]

✓ Answer
Phytoplankton → zooplankton → small fish → large fish (1). Primary consumer: zooplankton (½); tertiary consumer: large fish (½).

Q43 **Very Short Answer** · 2 marks ★ 1 paper

Rearrange the following according to their ascending trophic levels in a food chain: Hawk, grass, snake, frog, grasshopper.

Source
Practice paper [F6 p.490]: Q25 [F6 p.493]; Q25 [F8 p.4]

✓ Answer
Grass → grasshopper → frog → snake → hawk (1). A food chain always starts with producers and ends with top consumers (1).

Q44 **Very Short Answer** · 2 marks ★ 1 paper

In the food chain given below, which position would a vulture occupy? Justify your answer.
Plants → Rabbit → wild cat → lion

Source
CBSE CFPQ (Competency Focused Practice Qs): Q119 [F6 p.61]

✓ Answer
After the lion (1). Vultures are scavengers that feed on the remains of dead organisms (1). (Official CFPQ key.)

Q45 **Very Short Answer** · 2 marks ★ 1 paper

Your uncle has come from the village to renew the contract to supply frogs to the laboratories of the colleges of the town. While talking to you, he mentioned that cases of malaria have increased in his village. In addition population of grasshoppers has also increased who are damaging crops. (i) What could be the reasons for such problems faced by villagers? (ii) What suggestions will you give to your uncle?

Source
Practice paper [F8 p.115]: Q25 [F8 p.118]

✓ Answer
(i) Frogs eat mosquitoes and grasshoppers; catching frogs reduced their number, so mosquitoes (malaria) and grasshoppers (crop damage) increased (1).
(ii) Stop supplying frogs so the balance of the food chain is restored (1).

Q46 **Very Short Answer** · 2 marks ★ 1 paper

In a national park, domestic animals from the nearby villages were sent to graze regularly. Over a period of time, the population of big cats or carnivores in the national park were found to decline. What is likely to have led to a decrease in the number of big cats?

Source
CBSE CFPQ (Competency Focused Practice Qs): Q183 [F6 p.97]

✓ Answer
• Cattle ate the grass/plants, so wild herbivores did not get enough food and their number fell (1).
• Fewer herbivores means less food for big cats (carnivores), so their number fell (1).

Q47 **Very Short Answer** · 2 marks ★ 1 paper

What will happen if all the carnivores are removed from the Earth?

Source
Sample Question Paper-17 (Class X, 2024-25): Q26 [F8 p.131–303]

✔ Answer
• The number of herbivores will increase a lot (1).
• Herbivores will overgraze, plants will be destroyed, and later the herbivores themselves will die for want of food — the balance of the ecosystem is disturbed (1).

Short Answer

Q48 **Short Answer** · 3 marks ★ Board ×1 2 papers

Consider the following food chain: Plants → Deer → Lion. In this food chain, state the impact of removing all the organisms of the second trophic level (i.e., Deer) on the organisms of the first and the third trophic levels. Will the impact be the same for the organisms in the third trophic level if they were part of the food web of the ecosystem? Justify your answer.

Source
CBSE Suppl. VI 31(B)/S (EFGH/S) (yr?): Q33 [F1 p.46]
Practice paper [F8 p.67]: Q25 [F8 p.70]
NCERT: NCERT Exercise Q4: "What will happen if we kill all the organisms in one trophic level?"; NCERT Exercise Q5: "Will the impact of removing all the organisms in a trophic level be different for different trophic levels? Can the organisms of any trophic level be removed without causing any damage to the ecosystem?"

✔ Answer
• First level: plants increase in number as nobody eats them (1).
• Third level: lions die of starvation / decrease as their only food is removed (1).
• In a food web the effect on lions would be less, because they can eat other herbivores — food webs have many alternative pathways (1).

Q49 **Short Answer** · 3 marks ★ Board ×1 1 paper

Study the picture given below showing three food chains (a), (b) and (c) and answer:
(i) Name the type of ecosystems that exist in food chains (b) and (c).
(ii) The first trophic level in all food chains are producers. Why? What percentage of solar energy do these producers capture for their use?
(iii) Why are the arrows shown in the diagram in one direction only and not vice versa? Justify.

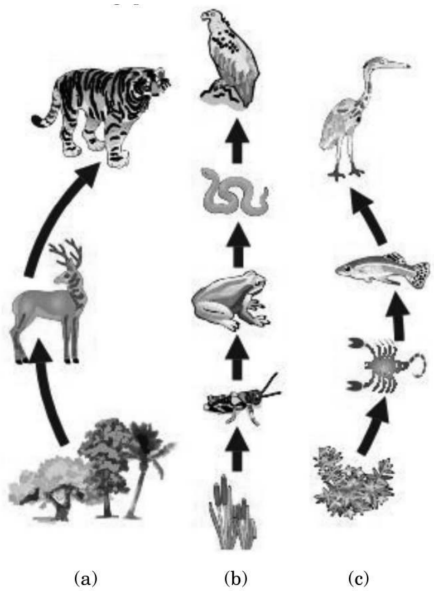


Figure from the question paper.

Source
CBSE 2024: 31/4/1 Q33 [F1 p.395]

✔ Answer
(i) (b) Grassland (terrestrial) ecosystem — grass → grasshopper → frog → snake → eagle; (c) Aquatic (pond) ecosystem — water plants → small water animal → fish → crane (½ + ½).
(ii) Producers (green plants) alone can make food from sunlight by photosynthesis; they capture about 1% of the sunlight falling on their leaves (½ + ½).
(iii) Energy flow is unidirectional — the energy that passes to the next level does not come back to the previous level (1).

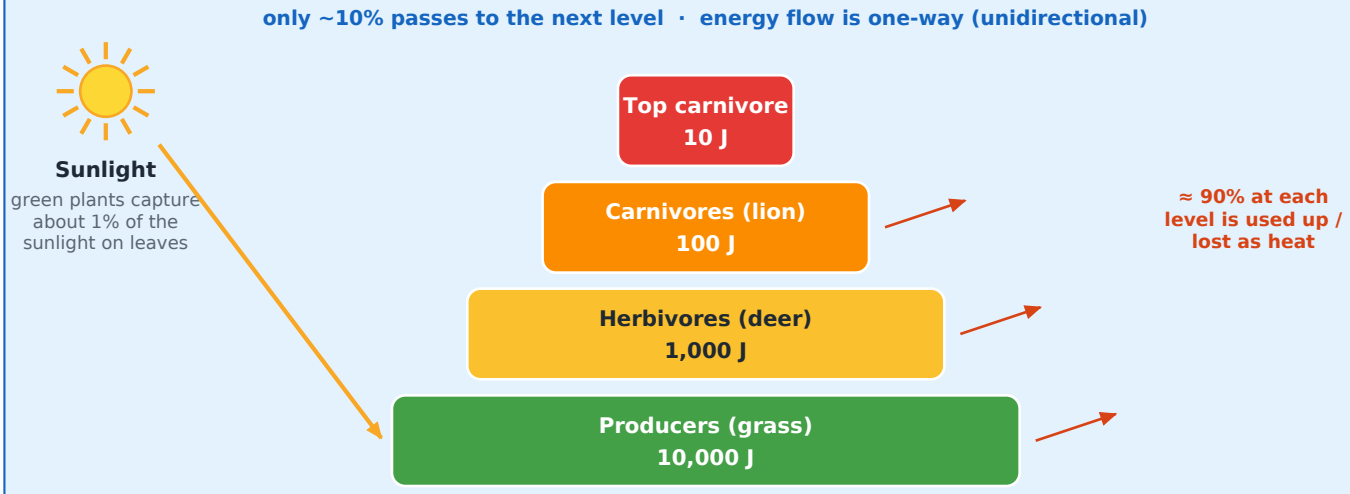
T2 Food chains and webs

2B. Flow of energy — 1% and 10% law (with numericals)

37 questions asked in **50** papers
17 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 4. Flow of energy — the 10 per cent law



MCQ

Q50 MCQ · 1 mark ★★ Board ×1 4 papers

In an ecosystem, the amount of energy of sunlight captured by green plants to convert it into food energy is

(A) 90%
(B) 99%
(C) 1%
(D) 10%

Source
CBSE Suppl. (yr?): 31/S/2 Q16 [F4 p.249]
Bangalore Sahodaya PB-1 2024-25: Q12 [F5 p.4]
Practice paper [F6 p.399]: Q3 [F6 p.399]; [F6 p.407]
Practice paper [F8 p.67]: Q15 [F8 p.69]; Q11 [F8 p.75]
Also asked as:
• Sahodaya/practice papers: "The percentage of solar radiation absorbed by all green plants for the process of photosynthesis is about —" (1%).

✔ Answer
(C) 1%.

Q51 MCQ · 1 mark ★★ Board ×1 4 papers

In an ecosystem, 10% of energy available for transfer from one trophic level to the next in a food chain is in the form of

(A) heat energy
(B) chemical energy
(C) mechanical energy
(D) light energy

Source
CBSE Suppl. EFGH/S (yr?): 31/S/3 Q16 [F4 p.334]
CBSE CFPQ (Competency Focused Practice Qs): Q169 [F6 p.93]
Bangalore Sahodaya PB-1 2024-25: Q16 [F5 p.16]
Practice paper [F6 p.354]: Q7 [F6 p.355]

✓ Answer
(B) chemical energy — energy stored in food (organic matter) is passed on.

Q52 MCQ · 1 mark ★★ Board ×1 4 papers

Consider the following food chain: Grass → Grasshopper → Frog → Snake → Eagle. If the amount of energy available at third trophic level is 50 kJ, the available energy at the producer level was

(A) 0.5 kJ
(B) 5 kJ
(C) 500 kJ
(D) 5000 kJ

Source
CBSE 2025: 31/6/3 Q16 [F4 p.11]
KVS Raipur PB-2 2025-26: Q13 [F5 p.299]; Q13 [F5 p.305]
KVS Lucknow PB-1 2024-25: Q16 [FM p.30]
KVS Lucknow PB 2025-26 (B): Q7 [FM p.79]
Also asked as:
• KVS Raipur PB-2 2025-26 Q13: 4 kJ at 4th level (Grass→Grasshopper→Frog→Snake→Hawk) → producer = 4000 kJ.
• KVS Lucknow PB-1 2024-25 Q16: 6 kJ at 4th level → 6000 kJ.
• KVS Lucknow PB 2025-26 Q7: 2 kJ at 4th level (Grass→Grasshopper→Frog→Snake) → 2000 kJ.

✓ Answer
(D) 5000 kJ. Given: frog (3rd level) = 50 kJ. By 10% law each lower level has 10 times more: grasshopper = 500 kJ, grass = 5000 kJ.

Q53 MCQ · 1 mark ★★ Board ×1 3 papers

A food chain will be more advantageous in terms of energy if it has

(A) 2 trophic levels
(B) 3 trophic levels
(C) 4 trophic levels
(D) 5 trophic levels

Source
CBSE 2024: 31/3/1 Q15 [F1 p.269]; 31/3/2 Q16 [F1 p.303]; 31/3/3 Q16 [F1 p.335]
KVS Lucknow PB-2 2024-25: Q15 [FM p.22]
Practice paper [F6 p.369]: Q5 [F6 p.369]

✓ Answer
(A) 2 trophic levels — only about 10% passes on at each step, so the shorter the chain the more energy reaches the last level.

Q54 MCQ · 1 mark ★★ Board ×1 3 papers

Which of the following limits the number of trophic levels in a food chain?

(A) Availability of water
(B) Deficient food supply
(C) Decrease in energy at higher levels
(D) Pollution in air

Source
CBSE 2026: 31/2/1 Q7 [F9 p.313]; 31/2/2 Q5 [F9 p.381]; 31/2/3 Q6 [F9 p.453]
Sample Case Studies (Class X): Q6 [F6 p.248]; Q10 [F6 p.253]
Practice paper [F8 p.115]: [F8 p.123]; Q15 [F8 p.117]

✔ Answer
(C) Decrease in energy at higher levels.

Q55 MCQ · 1 mark ★★ 3 papers

Which of the following describes the flow of energy and nutrients, respectively, through the ecosystem?

bidirectional and cyclic
unidirectional and cyclic
cyclic and bidirectional
cyclic and unidirectional

Source
CBSE Competency-Based Qs, chapter-wise: Q3 [F4 p.809]
Sample Case Studies (Class X): Q6 [F6 p.247]; Q10 [F6 p.253]
Sample Question Paper-17 (Class X, 2024-25): Q16 [F8 p.131–303]

✔ Answer
Unidirectional and cyclic — energy flows one way; nutrients (matter) are recycled.

Q56 MCQ · 1 mark ★ 2 papers

What is the ratio of the amount of energy absorbed by the primary consumer to the amount of energy absorbed by the secondary consumer in the following food chain?

a) 1:2
b) 2:1
c) 1:10
d) 10:1

Source
CBSE Competency-Based Qs, chapter-wise: Q2 [F4 p.809]
Bangalore Sahodaya PB 2023-24: Q15 [F5 p.528]
Also asked as:
• CBSE competency Qs (Ch 15) Q2: "What is the ratio of average amount of energy absorbed by producers to the average amount of energy absorbed by the primary consumers?" → 10:1.

✔ Answer
d) 10:1 — the secondary consumer gets only about 10% of the energy of the primary consumer.

Q57 MCQ · 1 mark ★ Board ×1 1 paper

The percentage of solar energy which is not converted into food energy by the leaves of green plants in a terrestrial ecosystem is about:

(A) 1% (B) 10%
(C) 90% (D) 99%

Source
CBSE 2025: 31/1/1 Q16 [F9 p.192]; 31/1/2 Q15 [F9 p.233]; 31/1/3 Q13 [F9 p.276]

✔ Answer
(D) 99% — green plants capture only about 1% of the sunlight that falls on their leaves.

Q58 MCQ · 1 mark ★ Board ×1 1 paper

In a food chain, where plants are eaten by insects, insects are eaten by frog and frog is eaten by snake, if the energy available to the frog is 100 J, then the energy available to the insects and snake respectively will be:

(A) 1000 J and 10 J (B) 10000 J and 10 J
(C) 10 J and 1000 J (D) 1000 J and 100 J

Source
CBSE 2026 VI 31(B) (E7FDG/5): Q6 [F9 p.71]

✔ Answer
(A) 1000 J and 10 J (insects one level below the frog: 100 × 10; snake one level above: 10% of 100).

Q59 MCQ · 1 mark ★ 1 paper

In an ecosystem, the 10% of energy available for transfer from one trophic level to the environment is in the form of:

Source
Bangalore Sahodaya PB-1 2025-26: Q3 [F5 p.545]

✔ Answer
B. heat energy — careful: this version says "to the environment". Energy lost to the surroundings at each level is lost as heat.

⚠ **Note:** Flagged: unusual wording (the 10% goes to the next level, not the environment). Paper key not seen.

Q60 MCQ · 1 mark ★ 1 paper

If the total energy at the trophic level of producers in an ecosystem is "E", then which of the following corresponds to the energy available to the tertiary consumers?

A. E/10 B. 10 × E
C. E/1000 D. 1000 × E

Source
CBSE CFPQ (Competency Focused Practice Qs): Q78 [F6 p.51]

✔ Answer
C. E/1000 — producer E → primary E/10 → secondary E/100 → tertiary E/1000.

Q61 MCQ · 1 mark ★ 1 paper

In which of the following food chains, does the man get more energy? Plant → Man; Plant → Goat → Man

Source
Practice paper [F8 p.67]: Q16 [F8 p.69]

✓ Answer
Plant → Man — fewer steps, so less energy is lost (man gets about 10% instead of about 1% of plant energy).

Q62 MCQ · 1 mark ★ 1 paper

Identify the incorrect statement. "The energy available to the producers is maximum" because:
A. It is the first trophic level which absorbs 1% of light energy directly from the source.
B. It utilizes the most of the chemical energy for its own respiration, growth, reproduction, movement etc.
C. It utilizes 10% of light energy and transfers the rest to the next trophic level.
D. It transfers only 10% of light energy to the next trophic level.

Source
CBSE SQP 2024-25: Q15 [F6 p.448]

✓ Answer
C. It is incorrect that producers use 10% of light energy and pass on the rest — they capture only about 1% of sunlight and pass on only about 10% of their energy. (Official SQP key.)

Q63 MCQ · 1 mark ★ 1 paper

In the given food chain, 100 J of energy is available to the lion. How much energy was available to the producers?
Plants → Deer → Lion

(a) 10 J
(b) 1000 J
(c) 10,000 J
(d) 1,00,000 J

Source
Sample Question Paper-17 (Class X, 2024-25): Q15 [F8 p.131–303]

✓ Answer
(c) 10,000 J — Plants 10,000 J → Deer 1,000 J → Lion 100 J (10% law).

Assertion–Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q64 **Assertion-Reason** · 1 mark ★★ Board ×1 3 papers

Assertion (A): The energy which passes to the herbivores does not come back to autotrophs.
Reason (R): The flow of energy in a food chain is unidirectional.

Source
CBSE 2023: 31/6/1 Q18 [F1 p.549]; 31/6/3 Q17 [F9 p.46]
Practice paper [F6 p.305]: Q11 [F6 p.314]
Practice paper [F8 p.99]: Q20 [F8 p.101]

✔ Answer
(A) Both true and R explains A — because the flow is one-way, energy that has gone to herbivores never returns to the autotrophs.

Q65 **Assertion-Reason** · 1 mark ★★ 3 papers

Assertion (A): Flow of energy in an ecosystem is unidirectional.
Reason (R): Energy captured by autotrophs does not revert back to the solar input but is passed onto the primary consumers.

Source
Bangalore Sahodaya PB 2023-24: Q20 [F5 p.528]
KVS Lucknow PB 2025-26 (B): Q9 [FM p.79]
Practice paper [F8 p.18]: Q20 [F8 p.21]; Q20 [F8 p.27]

✔ Answer
(A) R explains why the flow is one-way.

Q66 **Assertion-Reason** · 1 mark ★ 2 papers

Assertion (A): The flow of energy in a food chain operating in an ecosystem is always unidirectional.
Reason (R): Lots of energy is lost as heat from living organisms at each trophic level of the food chain.

Source
Bangalore Sahodaya PB-1 2024-25: Q20 [F5 p.6]
Sample Question Paper-16 (Class X, 2024-25): Q19 [F8 p.131–303]

✔ Answer
(B) Both true, but loss of energy as heat explains why energy decreases, not why it flows in one direction.

Q67 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): The energy transferred to a lion when it eats a deer is only a small fraction of the deer's total energy content.
Reason (R): Energy transfer is efficient at all trophic levels with nearly 90% of energy passed on to the next level.

Source
CBSE 2026: 31/8/1 Q9 [F4 p.97]; 31/8/2 Q8 [F4 p.129]; 31/8/3 Q8 [F4 p.161]

✔ Answer
(C) A is true; R is false — only about 10% passes on; about 90% is used/lost as heat at each level.

Q68 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): There are generally a greater number of individuals at the lower trophic levels of an ecosystem.
Reason (R): The greatest number is of the producers.

Source
CBSE 2026: 31/2/1 Q9 [F9 p.315]; 31/2/2 Q8 [F9 p.385]; 31/2/3 Q9 [F9 p.455]

✔ Answer
(B) Both are true, but R only restates A for producers; the real reason is the loss of energy at each level.
[Flag: check with the official 2026 key when it is released.]

Q69 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Greater number of individuals are present in lower trophic levels of all food chains.
Reason (R): As the amount of energy decreases at each successive trophic level, larger number of individuals are required at the lower trophic levels to support higher/next trophic levels.

Source
CBSE VI 31(B) (code 11-31(B)) (yr?): Q20 [F9 p.133]

✔ Answer
(A) R explains A.

Q70 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): A food chain can have maximum of three trophic levels.
Reason (R): Energy available at each trophic level keeps on decreasing as we move higher up the food chain.

Source
Practice paper [F6 p.257]: Q9 [F6 p.258]; Q9 [F6 p.290]

✔ Answer
(D) A is false — food chains generally have 3 or 4 steps and can have up to 4–5 levels; R is true.

Q71 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Food chains are limited to 4–5 trophic levels.
Reason (R): The flow of energy within trophic levels follows the 10% law.

Source
Sample Question Paper-11 (Class X, 2024-25): Q19 [F8 p.131–303]

✔ Answer
(A) Both true and R explains A — only about 10% of energy passes to the next level, so after 4–5 levels too little energy is left to support another level.

⚠ **Note:** The paper's own key gives (B). NCERT: "Since so little energy is available for the next level of consumers, food chains generally consist of only three or four steps" — the 10% law is exactly the reason, so (A) is kept.

Very Short Answer

Q72 Very Short Answer · 2 marks ★★★ Board ×4 6 papers

Describe why food chains generally consist of a few steps.

Source
CBSE 2026 VI 31(B) (LMNK2): Q12 [F1 p.65]
CBSE 2026: 31/4/1 Q11 [F4 p.372]
CBSE 2026: 31/7/3 Q11 [F4 p.70]
CBSE 2024: 31/3/3 Q26 [F1 p.341]
CBSE Competency-Based Qs, chapter-wise: Q9 [F4 p.811]
CBSE CFPQ (Competency Focused Practice Qs): Q120 [F6 p.62]
Also asked as:
• 2026 (31/4/1) Q11: "Explain why food chains generally consist of three or four steps."
• 2026 (31/7/3) Q11(b): "Why do food chains in an ecosystem generally consist of only three or four steps?"
• 2024 (31/3/3) Q26(b): "A food chain should not have more than four to five trophic levels." (Give reason)
• CBSE competency Q9: "Lions have no known natural predators. Based on energy transfer in a food chain, what could be the most likely reason?"
• CFPQ Q120: food chain with too many levels — "Is such a food chain likely to exist in nature?"

✓ Answer
• At each trophic level only about 10% of the energy is passed on to the next level; the rest is used for life processes or lost as heat (1).
• So after three or four steps very little usable energy is left for the next level; hence food chains have only 3–4 steps (1).

Q73 Very Short Answer · 2 marks ★★ 4 papers

Look at these two food chains: (a) Plants → Mice → Snakes → Hawks (b) Plants → Mice → Hawks. The producers in each chain have 100 J of energy. In which chain do the hawks get more energy, and how much? Give the reason.

Source
Practice sample paper, set 4: Q25 [F5 p.357]; Q25 [F5 p.369]
Practice sample paper, set 3: Q25 [F4 p.604]; Q25 [F4 p.616]
Practice sample paper, set 5: Q23 [F4 p.640]; Q23 [F4 p.653]
Practice paper [F8 p.82]: Q25 [F8 p.85]; Q25 [F8 p.92]

✓ Answer
In chain (b) (1). Plants 100 J → mice 10 J → hawks 1 J; in (a) hawks get only 0.1 J (100 → 10 → 1 → 0.1) (½). Only 10% of energy passes to the next level, so a shorter chain gives more energy (½).

Q74 **Very Short Answer** · 2 marks ★★ Board ×1 3 papers

In the following food chain, if 50 J of energy was available to the hawk, how much energy would have been present at the first and third trophic levels? Justify your answer.
Grass → Grasshopper → Frog → Snake → Hawk

Source
CBSE 2023: 31/5/1 Q26 [F1 p.468]
KVS Lucknow PB-2 2024-25: Q24 [FM p.23]
Practice paper [F6 p.399]: Q11 [F6 p.400]
Also asked as:
• Practice paper: "In the food chain Plants → rats → snakes → hawks, 20 J of energy was available to the hawks. How much would have been present in the plants?" → 20,000 J.
• KVS Lucknow PB-2 2024-25 Q24: "If the amount of energy available at the third trophic level is 100 joules, how much energy will be available at the producer level? Is it possible to have 2 more trophic levels just before the 4th level?" → 10,000 J; No — too little energy would be left.

✔ Answer
Given: hawk (5th level) = 50 J. Rule: each level gets 10% of the level below, so the level below has 10 times more (½).
Snake (4th) = 500 J; Frog (3rd) = 5000 J (½); Grasshopper (2nd) = 50,000 J; Grass (1st) = 5,00,000 J (½).
Answer: 1st level = 5,00,000 J; 3rd level = 5000 J (½).

Q75 **Very Short Answer** · 2 marks ★★ 3 papers

Why is the flow of energy in a food chain always unidirectional?

Source
Bangalore Sahodaya PB-1 2025-26: Q10 [F5 p.547]
Practice paper [F6 p.305]: Q11 [F6 p.306]
Practice paper [F8 p.99]: Q25 [F8 p.102]; Q25 [F8 p.108]
Also asked as:
• 2026 (31/8/2) Q14(b) (part of a 3-mark question).
• Practice papers: "Give reason: flow of energy in a food chain is unidirectional"; "What are the characteristics of energy transfer in biosphere?"

✔ Answer
• Energy captured by autotrophs does not revert back to the solar input (1).
• Energy which passes to the herbivores does not come back to the autotrophs; as it moves up the levels it is no longer available to the previous level (1).

Q76 **Very Short Answer** · 2 marks ★★ 3 papers

a) From the following group of organisms create a food chain which is most advantageous for human beings in terms of energy: Cereal plant, rats, hawk, goat, snake, human being.
b) State the possible disadvantages if the cereal plant is growing in soil rich in pesticides.

Source
Bangalore Sahodaya PB-1 2024-25: Q26 [F5 p.18]
Practice sample paper, set 1: Q26 [F4 p.572]; [F4 p.583]
Practice paper [F6 p.414]: Q11 [F6 p.415]; Q11 [F6 p.423]

✔ Answer
a) Cereal plant → human being (shortest chain, most energy) (1).
b) Pesticides are absorbed by the plant, enter the food chain and get accumulated in our body — biological magnification (1).

Q77 **Very Short Answer** · 1 mark ★ Board ×2 2 papers

In a food chain, if 10,000 joules of energy is available to the producer, how much energy will be available to the secondary consumer to transfer it to the tertiary consumer?

Source
CBSE old paper (Series BRH, 31/1) (pre-2020, yr?): Q4 [F6 p.209]
CBSE old paper (Series BRH/2, 31/2/1) (pre-2020, yr?): Q4 [F5 p.576]
Also asked as:
• Old CBSE (BRH/2, 31/2/1) Q4: "Consider the food chain Grass → Deer → Lion. If 10000 J of solar energy is available to the grass, how much energy would be available to the deer to transfer it to the lion?" → taking 10,000 J as the energy in grass, the deer gets 1,000 J (10%), of which about 100 J passes to the lion.

✓ Answer
100 J — producer 10,000 J → primary consumer 1,000 J → secondary consumer 100 J (10% law) (1).

⚠ **Note:** BRH/2 wording says "solar energy". If the 1% capture by grass is also applied, grass has 100 J and the deer 10 J. Check the marking scheme; teach the 10% law answer (1,000 J with the deer).

Q78 **Very Short Answer** · 2 marks ★ 2 papers

a. Construct a food chain of four trophic levels operating in a grassland. If the energy available to the organisms of 4th trophic level is 75 joules, how much energy was available with the organisms of the 2nd trophic level for transfer to the next trophic level? Justify your answer.
b. Why is the flow of energy unidirectional in a food chain?

Source
Bangalore Sahodaya PB-1 2025-26: Q10 [F5 p.546]
Practice paper [F6 p.305]: Q11 [F6 p.306]

✓ Answer
a. Grass → grasshopper → frog → snake (½). 4th level (snake) = 75 J, so 3rd level (frog) had 750 J and 2nd level (grasshopper) had 7500 J; the grasshopper transfers 10% of 7500 J = 750 J to the frog (1).
b. Energy captured does not go back to the previous level (½).

⚠ **Note:** Proof check: the practice-paper key stops at 750 J (3rd level). The 2nd level had 7500 J; "available for transfer to the next level" = 750 J. Flagged as ambiguous wording.

Q79 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Write the percentage of the energy of sunlight captured by green plants, to convert it into food energy. Explain the fate of this energy when green plants are eaten by primary consumers.

Source
CBSE 2025: 31/6/3 Q26 [F4 p.17]

✓ Answer
• About 1% of the sunlight falling on the leaves (½).
• When herbivores eat plants, a great deal of energy is used for their life processes and lost as heat (½); some goes into digestion and growth; only about 10% is stored in their body and is available to the next level (1).

Q80 **Very Short Answer** · 2 marks ★ 1 paper

In a food chain comprising tiger, plants and goat, among these which will (a) transfer the maximum amount of energy to the next trophic level; (b) receive the minimum amount of energy?

Source
KVS RO Varanasi paper: Q3 [F5 p.275]

✓ Answer
(a) Plants (producers) (½+½). (b) Tiger (top consumer) (½+½).

Short Answer

Q81 **Short Answer** · 3 marks ★★ 3 papers

(a) Create a food chain of the following organisms: Insect, Hawk, Grass, Snake, Frog.
(b) If 10,000 Joules of energy is available to frogs, how much energy will be available to snakes and the insects in this food chain?

Source
Bangalore Sahodaya PB-1 2024-25: Q31 [F5 p.8]
KVS Delhi PB-II 2024-25: Q33 [FM p.91]
KVS Lucknow PB-II 2023-24: Q26 [FM p.37]
Also asked as:
• KVS Delhi PB-II 2024-25 Q33 (3 marks): same chain + third trophic level (frog), highest non-biodegradable chemical (hawk), phenomenon (biological magnification), energy to snakes (1000 J).
• KVS Lucknow PB-II 2023-24 Q26 (2 marks): same organisms — which will have the highest concentration of non-biodegradable chemicals? Name the phenomenon. (see M10)

✓ Answer
(a) Grass → insect → frog → snake → hawk (1).
(b) Snake (next level above frog) = 10% of 10,000 J = 1000 J (1). Insects (level below frog) must have had 10 times more = 1,00,000 J (1).

Q82 **Short Answer** · 3 marks ★ Board ×1 2 papers

(a) Write the percentage of (i) solar energy captured by the autotrophs and (ii) energy transferred from autotrophs to the next level in a food chain.
(b) What are trophic levels? Why do different food chains in an ecosystem not have more than four to five trophic levels? Give reason.

Source
CBSE 2023: 31/6/1 Q33 [F1 p.557]; 31/6/3 Q29 [F9 p.52]
Practice paper [F6 p.369]: Q11 [F6 p.370]

✓ Answer
(a) (i) About 1% (½); (ii) about 10% (½).
(b) Each step or level of the food chain is a trophic level (1). Only 10% of energy passes to the next level; after 4–5 levels too little usable energy is left to support another level (1).

Q83 **Short Answer** · 3 marks ★ Board ×1 1 paper

(i) Construct a food chain of four trophic levels comprising the following: Hawk, snake, plants, rat.
(ii) 20,000 J of energy was transferred by the producers to the organism of second trophic level. Calculate the amount of energy that will be transferred by organisms of the third trophic level to the organisms of the fourth trophic level.

Source
CBSE 2023: 31/1/1 Q33 [F1 p.104]; 31/1/2 Q27 [F1 p.134]; 31/1/3 Q32 [F1 p.170]

✓ Answer
(i) Plants → rat → snake → hawk (1).
(ii) Given: rat (2nd level) receives 20,000 J (½). By 10% law, snake (3rd) receives 10% of 20,000 = 2000 J (½). Snake passes 10% of 2000 J to the hawk (4th) = 200 J (1).
Answer: 200 J.

⚠ **Note:** OR-part of the kitchen-garden question (E15) in all 2023 (31/1) sets. Proof check: "transferred to the 2nd level" = 20,000 J at the rat, not at the plant.

Q84 **Short Answer** · 3 marks ★ 1 paper

a). In the following food chain, calculate the amount of energy available to Tiger, if energy radiated by sun is 10,000 KJ. Grass → Deer → Tiger → Mushroom
b). Name the trophic level represented by Tiger.
c). What is the role of Mushroom in the ecosystem?

Source
KVS Lucknow PB-I 2023-24: Q28 [F5 p.256]; Q28 [FM p.44]

✓ Answer
a) Grass captures 1% of 10,000 kJ = 100 kJ; deer gets 10 kJ; tiger gets 1 kJ (1).
b) Tiger — third trophic level (secondary consumer / carnivore) (1).
c) Mushroom is a decomposer — breaks down dead remains into simple substances that go back to the soil (1).

⚠ **Note:** Flag: the mushroom is a decomposer, so it is not really a trophic level of this chain.

Long Answer

Q85 **Long Answer** · 5 marks NEW

[NEW] (a) What is a food chain? Why is a food chain always started with a producer? (b) In a grassland food chain grass → grasshopper → frog → snake → hawk, the grass has 20,000 J of energy. Calculate the energy available to the snake. (c) Why is the flow of energy unidirectional? (d) Why do food chains generally have only three or four steps?

Source [NEW] — gap-filler, not from a paper.

✓ Answer
(a) The series of organisms taking part at various biotic levels, where each eats the one below, forms a food chain (1); only producers can make food from sunlight (1).
(b) Grasshopper 2000 J, frog 200 J, snake 20 J (1).
(c) Energy captured by autotrophs does not go back to the sun, and energy passed to herbivores does not come back to autotrophs (1).
(d) Only about 10% energy passes on at each step; very little is left after 3–4 steps (1).

Case / Source-based

Q86 **Case / Source-based** · 4 marks ★ 1 paper

Food chains are very important for the survival of most species. (Read the passage on producers and chemotrophs.)
(i) If 10,000 J solar energy falls on green plants in a terrestrial ecosystem, what percentage of solar energy will be converted into food energy? a) 10,000 J b) 100 J c) 1000 J d) depends on the plant
(ii) If Ravi is consuming curd/yogurt for lunch, which trophic level should he be considered as occupying?
(iii) Decomposers are not included in the food chain because decomposers: a) act at every trophic level …
(iv) Movement of matter and energy in an ecosystem …
(v) Which of the following limits the number of trophic levels in a food chain?

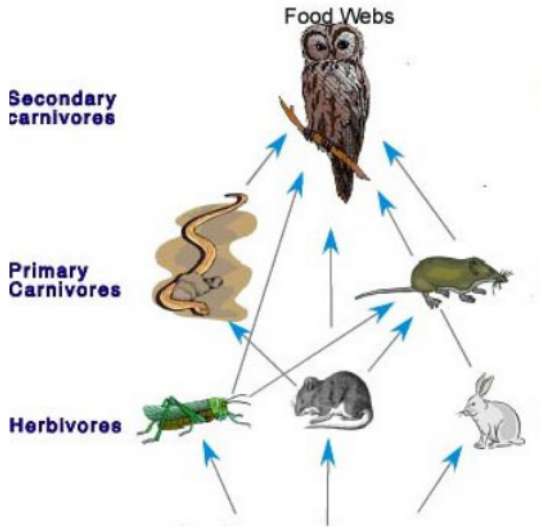


Figure from the question paper.

Source
Sample Case Studies (Class X): Q6 [F6 p.247]; Q10 [F6 p.252]

✔ Answer
(i) b) 100 J (1% of 10,000 J). (ii) Third trophic level (milk → cow is 2nd level) (1). (iii) a) They act at every trophic level. (iv) c) Energy is unidirectional and matter is repeatedly circulating. (v) a) Decrease in energy at higher trophic levels. (Key given in source.)

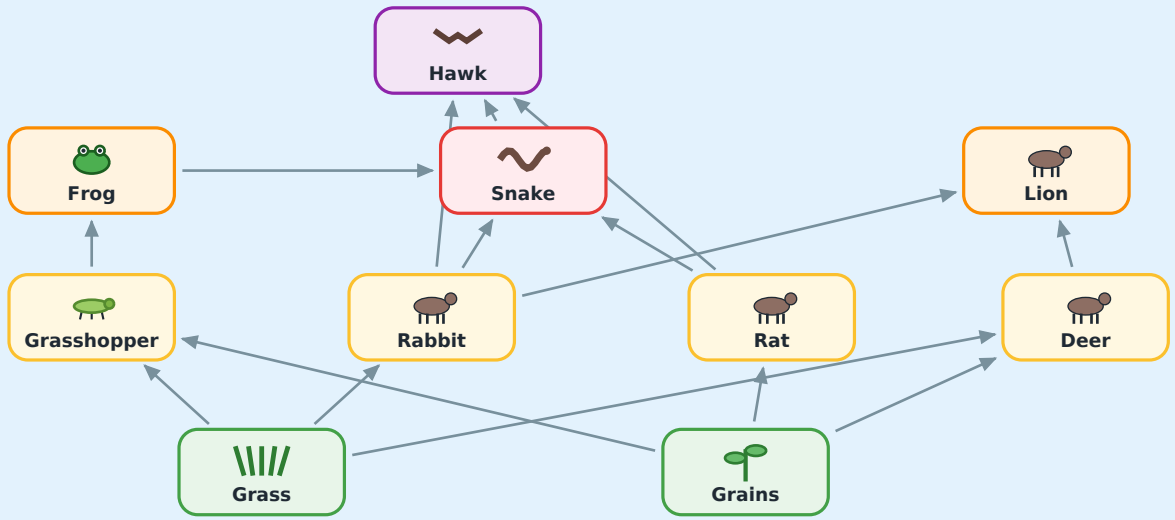
T2 Food chains and webs

2C. Food web

8 questions
asked in **12** papers
3 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 5. A food web — many food chains joined together



MCQ

Q87 **MCQ** · 1 mark ★★★ 6 papers

Food web is constituted by
a) relationship between animals and environment.
b) relationship between plants and animals
c) various interlinked food chains in an ecosystem
d) relationship between the organisms and the environment

Source
KVS Lucknow PB 2025-26 (A): Q7 [FM p.72]
Practice sample paper, set 3: Q16 [F4 p.601]; Q16 [F4 p.614]
Practice sample paper, set 5: Q14 [F4 p.636]; Q14 [F4 p.651]
Practice paper [F6 p.383]: Q5 [F6 p.384]; [F6 p.391]
Practice paper [F8 p.115]: Q16 [F8 p.117]; [F8 p.123]
Practice paper [F8 p.82]: Q15 [F8 p.84]

✓ Answer
c) various interlinked food chains in an ecosystem.

Q88 **MCQ** · 1 mark ★ Board ×1 1 paper

Study the given figure of a Food web and identify the primary consumer in the food web:

(a) Mice and Bear
(b) Rabbit and Cat
(c) Rabbit and Fox
(d) Mice and Rabbit

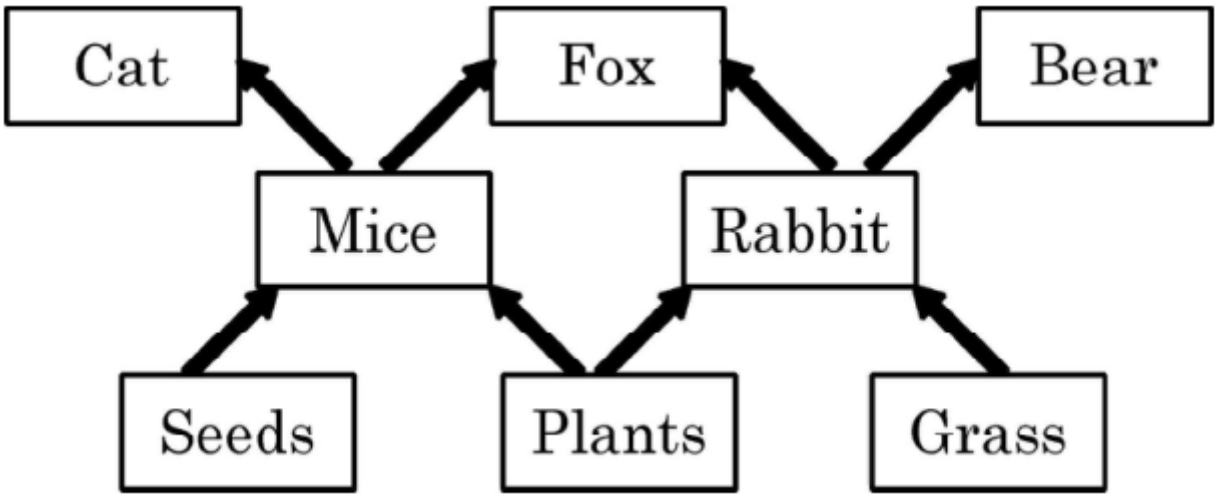


Figure from the question paper.

Source
CBSE 2023: 31/6/1 Q10 [F1 p.543]; 31/6/2 Q16 [F9 p.13]

✔ Answer
(d) Mice and Rabbit — they eat plants (herbivores).

Assertion–Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q89 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Food web is a network of several food chains operating in an ecosystem.
Reason (R): Food web decreases the stability of an ecosystem.

Source
CBSE 2025: 31/6/3 Q19 [F4 p.13]

✔ Answer
(C) A is true; R is false — a food web increases stability because organisms have other food if one kind is lost.

Very Short Answer

Q90 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Give reasons for the following:
(a) Food web is more stable than a food chain in an ecosystem.
(b) A food chain should not have more than four to five trophic levels.

Source
CBSE 2024: 31/3/3 Q26 [F1 p.341]

✓ Answer
(a) In a food web an organism has more than one food source, so if one organism is removed others are available; in a single chain removing one link breaks it (1).
(b) Only about 10% energy passes on; beyond 4–5 levels too little energy is left (1).

Q91 **Very Short Answer** · 1 mark ★ 1 paper

State what is required for two or more food chains to form a food web.

Source
CBSE CFPQ (Competency Focused Practice Qs): Q122 [F6 p.62]

✓ Answer
They must have an organism that is eaten by two or more other kinds of organisms (common link) (1).
(Official CFPQ key.)

Q92 **Very Short Answer** · 2 marks ★ 1 paper

Study the food web given below. (i) Identify and write the food chain from the web shown, in which the eagle will receive the highest percentage of energy from the producers. (ii) Which organism will be most affected in the above web when a non-biodegradable pesticide is introduced in the soil? What is the phenomenon called?

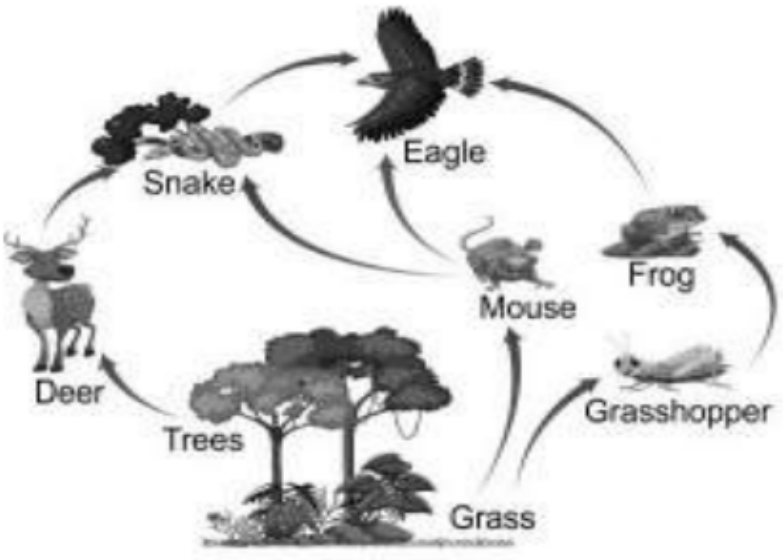


Figure from the question paper.

Source
Bangalore Sahodaya PB 2023-24: Q26 [F5 p.530]

✓ Answer
(i) The shortest chain ending in the eagle, e.g. grass → mouse → eagle (1).
(ii) The eagle (top level) (½); biological magnification (½).

Q93 **Very Short Answer** · 2 marks ★ 1 paper

A food web consists of many interrelated food chains. An aquatic food web is shown. Consider that a dam is constructed across the river where this aquatic food web exists. The small fishes in the river generally travel upstream to lay eggs which was not possible after the construction of the dam. The population of which organism is MOST likely to increase due to the construction of the dam? Justify.

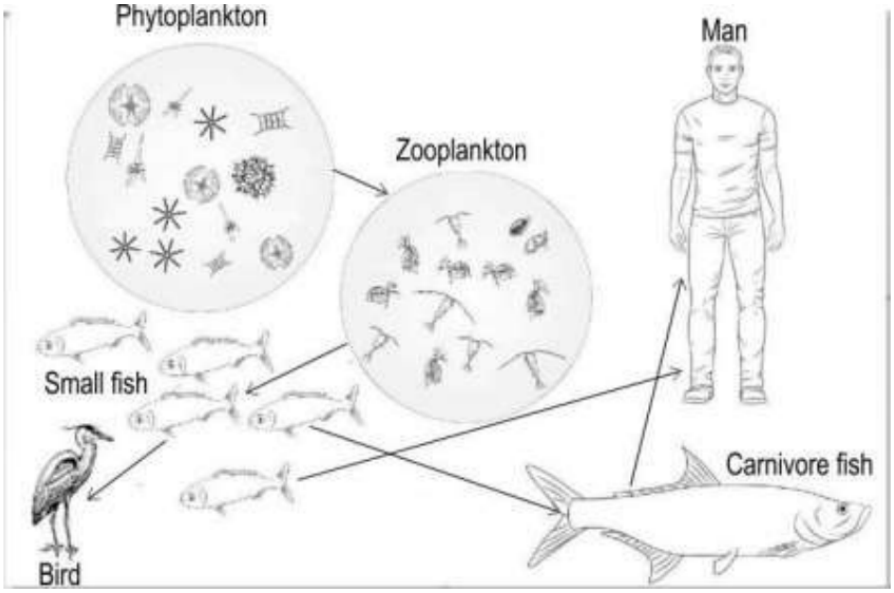


Figure from the question paper.

Source
CBSE CFPQ (Competency Focused Practice Qs): Q175 [F6 p.95]

✓ Answer
Zooplankton (1) — small fish cannot lay eggs, their number falls, so fewer zooplankton are eaten (1). (Official CFPQ key.)

Case / Source-based

Q94 **Case / Source-based** · 4 marks ★ 1 paper

Observe the sea-shore food web and answer: (i) The mussel can be described as — (ii) Which trophic level is incorrectly defined? a) Carnivores – secondary or tertiary consumers b) Decomposers – microbial heterotrophs c) Herbivores – primary consumers d) Omnivores – molds, yeast and mushrooms (iii) The given figure best represents — (iv) Why do all food chains start with plants? (v) Which two organisms are competing for food?

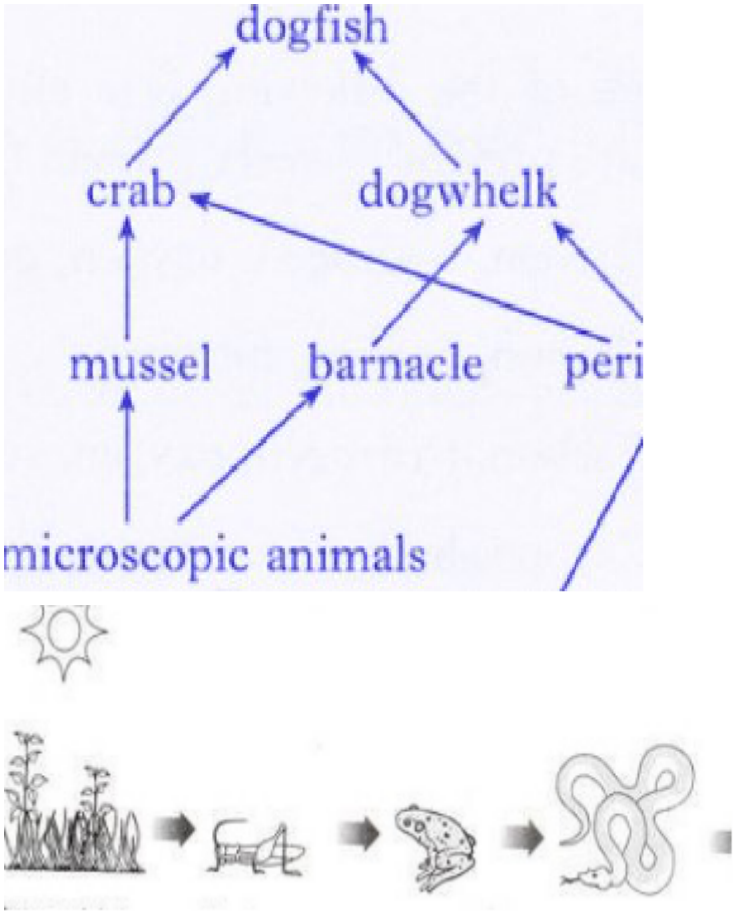


Figure from the question paper.

Source
Sample Case Studies (Class X): Q7 [F6 p.248]; Q11 [F6 p.254]

✓ Answer
(i) c) Secondary consumer — the mussel eats microscopic animals (1).
(ii) d) Omnivores – moulds, yeast and mushrooms (these are decomposers).
(iii) a) Grassland food chain — grass → grasshopper → frog → snake.
(iv) Plants can make their own food using sunlight.
(v) Key: B and D (from Case 7, whose figure is on F6 p.248).

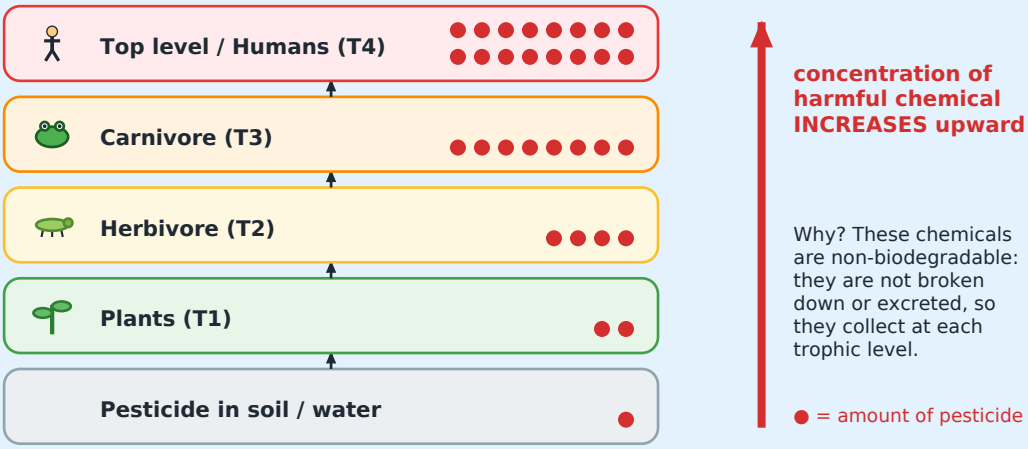
T2 Food chains and webs

2D. Biological magnification

20 questions asked in **36** papers
20 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 6. Biological magnification — harmful chemicals increase at each level



MCQ

Q95 MCQ · 1 mark ★ Board ×1 2 papers

Biomagnification refers to the increase in the
(A) body weight of an organism.
(B) growth of phytoplanktons.
(C) the amount of harmful chemicals in the successive trophic levels of a food chain.
(D) number of plants and animals in an area.

Source
CBSE Suppl. (yr?): 31/S/1 Q16 [F4 p.193]; 31/S/2 Q15 [F4 p.249]
Practice paper [F8 p.34]: Q15 [F8 p.36]

✓ Answer
(C) amount of harmful chemicals in the successive trophic levels of a food chain.

Q96 **MCQ** · 1 mark ★ Board ×1 1 paper

In the given figure (trophic levels T1 to T5), identify the trophic level having maximum concentration of harmful chemicals.

(A) T1
(B) T5
(C) T4
(D) T3

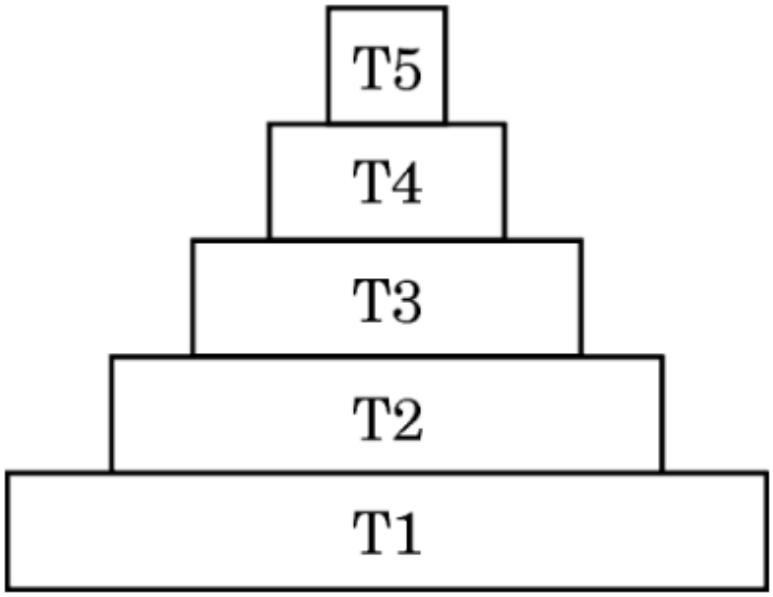


Figure from the question paper.

Source
CBSE 2026: 31/2/1 Q6 [F9 p.313]; 31/2/2 Q6 [F9 p.383]; 31/2/3 Q6 [F9 p.453]

✓ Answer
(B) T5 — the top (last) trophic level has the maximum concentration.

Q97 **MCQ** · 1 mark ★ 1 paper

Biological magnification is the increase in concentration of certain substances in the tissues of organisms at successively higher levels in a food chain. Which of the following could the increase be a result of?
P) Inability of environmental processes to break down the substance.
Q) High rate of excretion of the substance by the organism.
R) Low rate of internal degradation of the substance by organisms.

A. Only P
B. Only P and R
C. Only Q and R
D. All - P, Q and R

Source
CBSE CFPQ (Competency Focused Practice Qs): Q80 [F6 p.51]

✓ Answer
B. Only P and R — the substance is not broken down outside or inside the body, so it keeps collecting. (Official CFPQ key.)

Q98 **MCQ** · 1 mark ★ 1 paper

Diclofenac is a drug that is administered to cattle that undergoes the process of biological magnification. Which of the following is likely to have the highest amount of the drug in it?

A. Cheetah
B. Vultures
C. Goats
D. Foxes

Source
CBSE CFPQ (Competency Focused Practice Qs): Q166 [F6 p.91]
Also asked as:
• CFPQ Q174 (2 marks): graph of vulture population and Diclofenac — (a) vultures died after eating carcasses of treated cattle; (b) after the ban their number may increase.

✓ Answer
B. Vultures — they feed on the dead cattle, at a higher level than the cattle. (Official CFPQ key.)

Assertion–Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q99 **Assertion-Reason** · 1 mark ★ 2 papers

Assertion (A): Vulture will always have the least amount of pesticides in a food chain.
Reason (R): Vulture occupies the last trophic level and it gets only 10% of energy of the previous trophic level.

Source
CBSE SQP 2025-26 (copy): Q9 [F5 p.283]; Q9 [F6 p.227]; Q9 [F8 p.305]
ALLEN Sample Paper 2025-26: Q9 [F8 p.334–349]

✓ Answer
(D) A is false — being at the last level the vulture has the MOST pesticide; R is true. (Official SQP key.)

Q100 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Highest percentage of pesticides is found in tertiary consumers in a food chain.
Reason (R): Chemicals pesticides get accumulated progressively at each trophic level.

Source
CBSE 2026: 31/4/1 Q9 [F4 p.372]; 31/4/2 Q8 [F4 p.402]; 31/4/3 Q8 [F4 p.434]

✓ Answer
(A) R explains A — accumulation at each level makes the highest (top) consumers have the most.

Q101 **Assertion-Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Biological magnification leads to the accumulation of maximum concentration of harmful chemicals in human beings.
Reason (R): Human beings occupy the top level in any food chain.

Source
CBSE 2026 VI 31(B) (E7FDG/5): Q9 [F9 p.73]

✓ Answer
(A) R explains A.

Q102 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Food chains are responsible for the entry of harmful chemicals into our bodies.
Reason (R): The length and complexity of food chains vary greatly.

Source
Sample Question Paper-17 (Class X, 2024-25): Q19 [F8 p.131–303]

✓ Answer
(B) Both true, but R is not the correct explanation of A — chemicals enter our bodies because we eat organisms of the chain; the length of chains does not explain this.

Very Short Answer

Q103 **Very Short Answer** · 2 marks ★★ Board ×2 5 papers

How do harmful chemicals get accumulated progressively at each trophic level in a food chain?

Source
CBSE 2023: 31/1/1 Q26 [F1 p.100]
CBSE old paper (Series RHB, 31/1) (pre-2020, yr?): Q3 [F6 p.193]
KVS Varanasi Region paper: Q3 [F5 p.259]
Practice paper [F6 p.369]: Q11 [F6 p.370]
Practice paper [F8 p.99]: Q25 [F8 p.102]
NCERT: NCERT Exercise Q6: "What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem?"
Also asked as:
• Old CBSE (RHB) Q3 (1 mark): "What is meant by biological magnification?"
• Practice paper: "What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem?" — Yes; lowest in producers, highest at the top level.

✓ Answer
• Pesticides and other chemicals used on crops are washed into the soil or water bodies and absorbed by plants/aquatic organisms (1).
• These chemicals are non-biodegradable — they are not broken down or excreted, so they get accumulated progressively at each trophic level as one organism eats another (biological magnification) (1).

Q104 **Very Short Answer** · 2 marks ★★ Board ×3 3 papers

Use of several pesticides which results in excessive accumulation of pesticides in rivers or ponds, is a matter of deep concern. Justify this statement.

Source
CBSE 2023: 31/4/1 Q26 [F1 p.367]
CBSE 2025: 31/1/1 Q26 [F9 p.196]; 31/1/2 Q21 [F9 p.237]
CBSE old paper (Series RHB, 31/1) (pre-2020, yr?): Q4 [F6 p.193]
Also asked as:
• 2025 (31/1/1, 31/1/2) Q26: "Excessive use of chemicals and pesticides in agriculture adversely effect the environment. Justify this statement."
• Old CBSE (RHB) Q4 (1 mark): "Give an example to illustrate that indiscriminate use of pesticides may result in the degradation of the environment."

✓ Answer
• Pesticides are non-biodegradable; from rivers/ponds they are taken up by aquatic plants and animals and enter the food chain (1).
• They get accumulated at each trophic level (biological magnification); the top consumers (big fish, birds, humans) get the highest amount and are harmed (1).

Q105 **Very Short Answer** · 2 marks ★ 2 papers

Observe the given diagram. (i) According to the given diagram, which animal is having lowest energy and which will have highest biological magnification? (ii) Which organism is the energy provider in the given diagram?

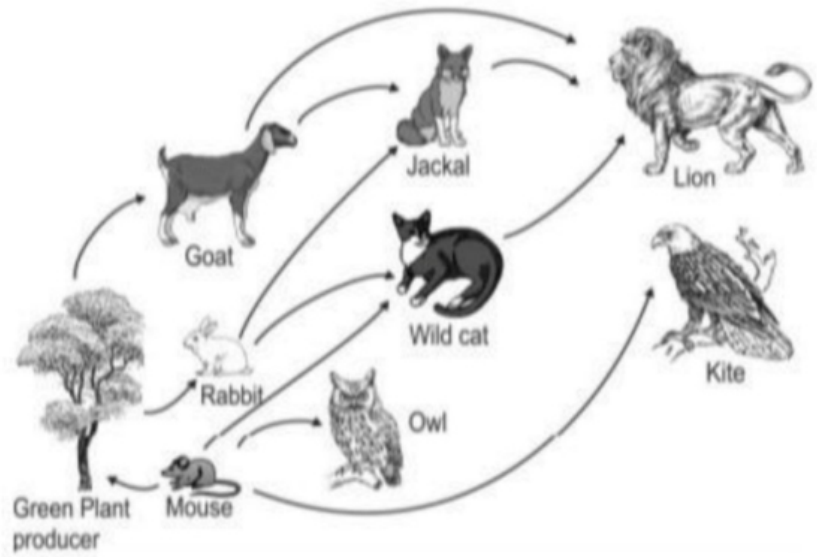


Figure from the question paper.

Source
KVS Lucknow PB 2025-26 (A): Q12 [FM p.72]
KVS Lucknow PB 2025-26 (B): Q12 [FM p.80]

✓ Answer
(i) Lion — it is at the last trophic level (green plant → goat/rabbit → jackal → lion), so it gets the lowest energy and has the highest biological magnification (1).
(ii) The green plant (producer) (1).

Q106 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Construct a food chain comprising the following organisms: Hawk, Frogs, Snakes, Plants. Which of these will have the highest concentration of the harmful chemicals such as pesticides? Name the phenomenon.

Source
CBSE VI 31(B) (ZWYX/5) (yr?): Q26 [F9 p.106]
Also asked as:
• KVS Lucknow PB-II 2023-24 Q26: "The following organisms form a food chain: Insects, Hawk, Grass, Snake, Frog. Which will have the highest concentration of non-biodegradable chemicals? Name the phenomenon." → Grass → insects → frog → snake → hawk; hawk; biological magnification.

✓ Answer
Plants → (insects) → frogs → snakes → hawk (1). Proof check: frogs do not eat plants — the herbivore (insect/grasshopper) link is missing from the given list; say so in the answer.
Hawk will have the highest concentration (½); biological magnification (½).

Q107 **Very Short Answer** · 2 marks ★ 1 paper

The cartoon addresses a growing concern (pesticide spraying). What impact will the process shown in the image have on humans if they occupy the last trophic level? Explain.
For visually impaired: Create a food chain with more than 2 trophic levels that exists in the cabbage farm. If humans occupy the last trophic level, then how would spraying pesticide affect the humans?

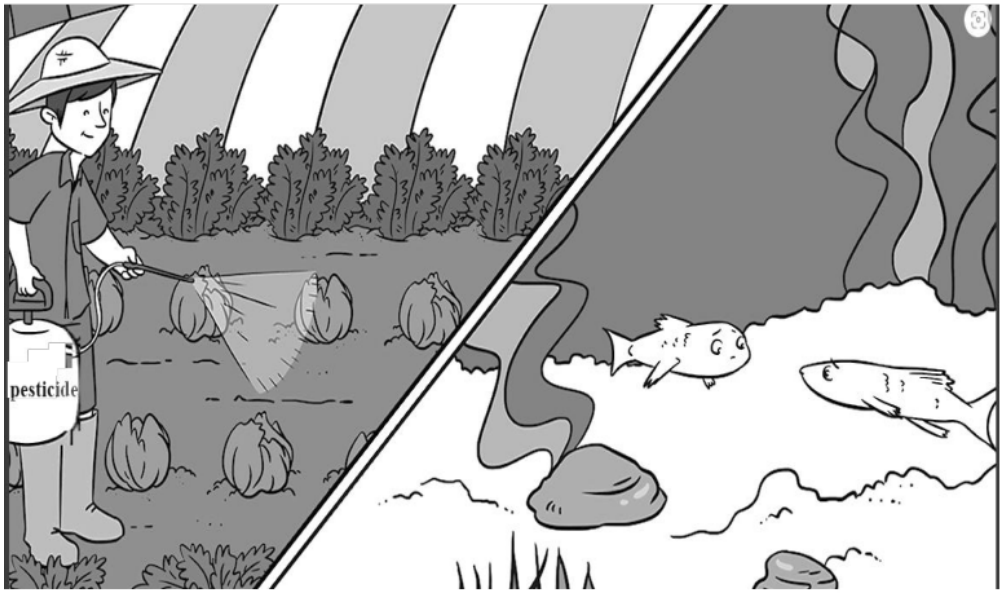


Figure from the question paper.

Source
CBSE SQP 2024-25: Q26 [F6 p.451]

✓ Answer
• Cabbage/plant → rabbit → snake → owl (any valid chain) (for VI, 1).
• Pesticides are non-biodegradable, persist for long and get accumulated at each trophic level; humans at the last level get the highest concentration — biological magnification (any 2 points) (1+1). (Official SQP key.)

Q108 **Very Short Answer** · 2 marks ★ 1 paper

The chart shows the concentration of DDT in organisms of the food chain: Algae (0.4 ppm) → zooplankton (0.5 ppm) → mackerel (5 ppm) → sea gull (25 ppm). a) Explain why the concentration of DDT increases drastically from the algae to the sea gull.

Source
Bangalore Sahodaya PB-1 2025-26: Q10 [F5 p.547]

✓ Answer
DDT is non-biodegradable; each organism eats many organisms of the lower level and does not break down or excrete DDT, so it gets accumulated progressively at each level — highest in the sea gull (biological magnification) (2).

⚠ **Note:** Other half of this OR (How is ozone formed?) is covered under O-questions.

Q109 **Very Short Answer** · 1 mark ★ 1 paper

Fishes like swordfish and king mackerel are tertiary consumers. Fishes like tilapia and salmon are secondary consumers. The habitat of these fishes is usually contaminated with heavy metals like mercury. Scientists advise eating tertiary-consumer fish only once a month. What phenomenon is likely to have led the scientists to give such an advisory?

Source
CBSE CFPQ (Competency Focused Practice Qs): Q33 [F6 p.30]

✓ Answer
Biomagnification of toxic substances in higher trophic levels (1). (Official CFPQ key.)

Q110 **Very Short Answer** · 2 marks ★ 1 paper

In a certain study conducted on the occurrence of DDT along food chains in an ecosystem, the concentration of DDT in grass was found to be 0.5 ppm. In sheep it was 2 ppm and in man it was 10 ppm. Why was the concentration of DDT maximum in case of man?

Source
Sample Question Paper-11 (Class X, 2024-25): Q26 [F8 p.131–303]

✓ Answer
• DDT is non-biodegradable; it is not broken down, so it gets accumulated at each trophic level (1).
• Man is at the highest (top) trophic level in the chain grass → sheep → man, so the concentration is maximum in man — biological magnification (1).

Short Answer

Q111 **Short Answer** · 3 marks ★★★ Board ×10 10 papers

Explain how some harmful chemicals enter our bodies through the food chain. Why is the concentration of these harmful chemicals found to be maximum in human beings?

Source
CBSE Suppl. VI 31(B)/S (CDBA/S) (yr?): Q30 [F1 p.17]
CBSE 2023: 31/2/1 Q33 [F1 p.196]; 31/2/2 Q28 [F1 p.221]; 31/2/3 Q31 [F1 p.250]
CBSE 2023: 31/5/2 Q27 [F1 p.497]
CBSE 2025: 31/2/3 Q33 [F9 p.494]
CBSE 2026: 31/5/1 Q14 [F4 p.468]; 31/5/2 Q13 [F4 p.500]; 31/5/3 Q13 [F4 p.532]
CBSE 2026: 31/7/1 Q14 [F4 p.38]; 31/7/2 Q13 [F4 p.52]; 31/7/3 Q13 [F4 p.70]
CBSE 2026: 31/8/2 Q14 [F4 p.131]
CBSE 2022 Term-II: 31/1/1 Q13 [F9 p.174]; 31/1/2 Q8 [F9 p.215]; 31/1/3 Q12 [F9 p.258]
CBSE Suppl. EFGH/S (yr?): 31/S/1 Q33 [F4 p.230]; 31/S/2 Q27 [F4 p.284]; 31/S/3 Q32 [F4 p.338]
CBSE old paper (Series LRH/1, 31/1/1) (pre-2020, yr?): Q26 [F6 p.150]; Q26 [F6 p.165]
Also asked as:
• Suppl. VI (CDBA/S) Q30: "Explain with the help of a terrestrial food chain how..." — add a chain, e.g. grass → grasshopper → frog → snake → hawk.
• 2025 (31/2/3) Q33: "Some harmful chemicals get accumulated in human bodies through the food chain. Name this phenomenon. Explain the reason of maximum concentration..."
• 2026 (31/5/x) Q14(b)/Q13(b): "Paddy fields require a large amount of water. The pesticides and chemical fertilizers used are washed down into the soil or waterbodies. How do these chemicals reach our bodies? What is this phenomenon known as?"
• 2026 (31/7/x) Q14(c)/Q13(c): "Farmers are using pesticides on the crop plants, but the chances of accumulation of harmful chemicals is greatest in human beings. Why? Name the phenomenon."
• 2026 (31/8/2) Q14(a): lake with algae, small fish, large fish and DDT — "In which organism will the concentration of DDT be the highest? Name and explain the phenomenon." → large fish; biological magnification.
• Suppl. EFGH/S Q33: "(a) Define the term biological magnification. (b) In the aquatic food chain Phytoplankton → Zooplankton → Fishes → Human, which trophic level will have highest effect and why?" → Human (top level).
• 2022 T-II Q13(b): "Why are the human beings most adversely affected by bio-magnification?"
• Old CBSE (LRH/1) Q26 (3 marks): "Explain the phenomenon of 'biological magnification'. How does it affect organisms belonging to different trophic levels particularly the tertiary consumers?" → the tertiary (top) consumers get the highest concentration.

✓ Answer
• Pesticides and other chemicals used to protect crops are washed down into the soil or water bodies (½).
• From the soil they are absorbed by plants with water and minerals; from water bodies they are taken up by aquatic plants and animals — so they enter the food chain (1).
• These chemicals are non-biodegradable, so they get accumulated progressively at each trophic level (½).
• Human beings occupy the top level in any food chain, so the maximum concentration collects in our bodies. This is biological magnification (1).

Q112 **Short Answer** · 3 marks ★ 2 papers

A farmer can choose from four new insecticides. The first collects in the bodies of predators, the second is broken down by soil bacteria, the third is easily washed into lakes and rivers, and the fourth is taken up by plant roots. Which one should he choose to keep pollution of the environment lowest? Why?

Source
Practice sample paper, set 2: Q30 [F5 p.320]
Practice sample paper, set 4: Q30 [F5 p.358]

✓ Answer
• The insecticide that is broken down by soil bacteria (biodegradable) (1).
• It is decomposed into harmless simple substances and does not enter the food chain (1).
• Non-biodegradable ones collect in fat tissues and pass up the food chain (biological magnification), polluting the environment (1).

Q113 **Short Answer** · 3 marks ★ Board ×1 1 paper

If a harmful chemical enters a food chain comprising peacock, plants, rats and snakes, which of these organisms is likely to have the highest concentration of the chemical in its body? Justify your answer. Name the process involved and define it.

Source
CBSE 2023: 31/6/2 Q33 [F9 p.22]

✔ Answer
• Food chain: plants → rats → snakes → peacock; the peacock will have the highest concentration (1).
• Justification: the chemical is non-biodegradable — it is not broken down or excreted, so it collects at each level and is highest at the top (last) trophic level (1).
• Process: biological magnification — the increase in concentration of harmful chemicals at each higher trophic level of a food chain (1).

Case / Source-based

Q114 **Case / Source-based** · 4 marks ★ 1 paper

Some information about a food chain is listed: Caterpillars are herbivores. Blackbirds eat secondary consumers. Eagles eat blackbirds. Spinach carries out photosynthesis.
(a) Draw a food chain using all of the information.
(b) What do the arrows in a food chain represent?
(c) A farmer sprays his spinach with pesticide and kills most of the caterpillars. Some caterpillars survive. Discuss the impact on the food chain.

Source
CBSE–British Council Science Item Bank: Q1 [F5 p.87]

✔ Answer
(a) Spinach → caterpillar → blackbird → eagle (1). Proof check: "blackbirds eat secondary consumers" would need one more level; with only these four organisms the chain is spinach → caterpillar → blackbird → eagle — flag this to students.
(b) Transfer of energy from the producer to the consumers (1).
(c) Less food for blackbirds and then eagles, so their numbers fall; pesticide in surviving caterpillars passes on and gets accumulated in blackbirds and eagles (biological magnification) (2).

⚠ **Note:** CBSE–British Council item (7 marks in source); trimmed to 4 marks.

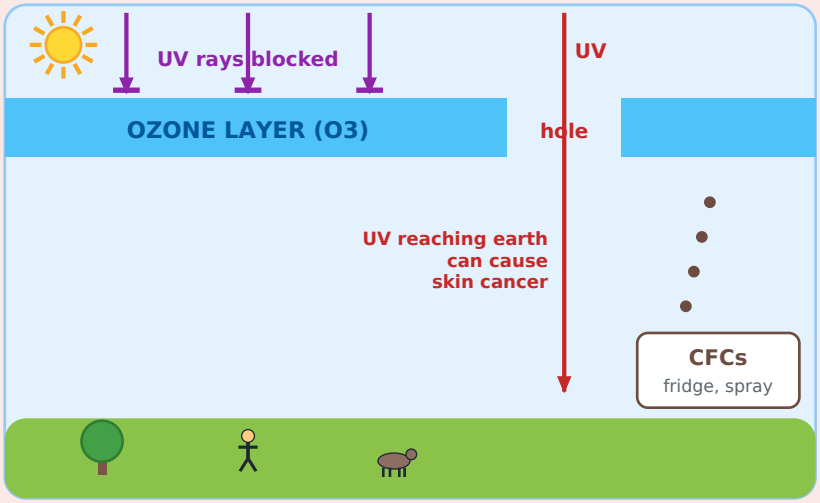
T3 How our activities affect the environment

3A. Ozone layer and how it is getting depleted

27 questions asked in **41** papers
22 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 7. Ozone layer — the shield against UV rays



How ozone forms

$O_2 \xrightarrow{UV} O + O$

$O + O_2 \rightarrow O_3$ (ozone)

at higher levels of the atmosphere

Depletion

- sharp fall in 1980s
- due to CFCs (refrigerants, fire extinguishers)
- UNEP 1987: freeze CFC production at 1986 levels

MCQ

Q115 MCQ · 1 mark ★★ Board ×1 3 papers

United Nations Environment Programme forged an agreement to

(A) control CO_2 emissions in the environment
(B) conserve biodiversity
(C) control water pollution
(D) reduce CFC production

Source
CBSE 2024: 31/3/2 Q9 [F1 p.299]
KVS Lucknow PB-1 2024-25: Q6 [FM p.29]
Practice paper [F6 p.430]: Q7 [F6 p.431]
Also asked as:
• KVS Lucknow PB-1 2024-25 Q6: "In 1987, an agreement was formulated by UNEP to freeze the production of X to prevent depletion of Y. X and Y are:" → c) CFCs; Ozone.

✓ Answer
(D) reduce CFC production — in 1987 UNEP got nations to freeze CFC production at 1986 levels.

Q116 MCQ · 1 mark ★ Board ×1 2 papers

Depletion of ozone is mainly due to

Source
CBSE old paper (Series BRH/1, 31/1/1) (pre-2020, yr?): Q3 [F5 p.496]
Practice paper [F8 p.99]: Q15 [F8 p.101]
Also asked as:
• Old CBSE (BRH/1) Q3 (1 mark): "Which class of chemicals is linked to the decrease in the amount of ozone in the upper atmosphere of the earth?" → chlorofluorocarbons (CFCs).

✓ Answer
Chlorofluorocarbons (CFCs).

Q117 MCQ · 1 mark ★ 2 papers

Which are the correct statements related to ozone?
(i) Ozone layer helps in increasing the UV radiations reaching earth.
(ii) Ozone is a deadly poison.
(iii) Ozone layer shields the earth from UV radiations.
(iv) Ozone layer prevents UV rays which cause skin cancer.
(v) Ozone is formed with the help of Chlorofluorocarbons.

A. (i), (ii), (iii)
B. (ii), (iii), (iv)
C. (iii), (iv), (v)
D. (i), (iv), (v)

Source
CBSE SQP 2025-26 (copy): Q6 [F5 p.283]; Q6 [F6 p.227]; Q6 [F8 p.305]
ALLEN Sample Paper 2025-26: Q6 [F8 p.334–349]

✔ Answer
B. (ii), (iii), (iv). (Official SQP key.)

Q118 MCQ · 1 mark ★ Board ×1 1 paper

Consider the following statements about ozone:
(a) Ozone is poisonous gas.
(b) Ozone shields the earth's surface from the infrared radiation from the sun.
(c) Ozone is a product of UV radiations acting on oxygen molecule.
(d) At the lower level of the earth's atmosphere, ozone performs most essential function.
The correct statements are

Source
CBSE 2024: 31/3/1 Q16 [F1 p.271]; 31/3/2 Q15 [F1 p.303]; 31/3/3 Q15 [F1 p.335]

✔ Answer
Statements (a) and (c). (b) is wrong — ozone shields us from ultraviolet (UV) radiation; (d) is wrong — its essential function is at the higher levels.

⚠ **Note:** Options are unreadable in the OCR copy of all three sets; mark the option "(a) and (c)".

Q119 MCQ · 1 mark ★ Board ×1 1 paper

Consider the following statements about ozone and choose the correct option:
(i) One molecule of ozone gas is formed by three atoms of oxygen.
(ii) Ozone is the product of UV radiations acting on oxygen (O_2) molecules.
(iii) Ozone performs an essential function at the lower levels of the atmosphere.
(iv) Ozone is very useful and is essential for all aerobic forms of life.

(A) (i) and (iii)
(B) (i) and (ii)
(C) (ii) and (iv)
(D) (iii) and (iv)

Source
CBSE 2026 VI 31(B) (E7FDG/5): Q7 [F9 p.71]

✔ Answer
(B) (i) and (ii). (iii) — its function is at the higher levels; (iv) — ozone is a deadly poison; it is oxygen that is essential for aerobic life.

Q120 MCQ · 1 mark ★ Board ×1 1 paper

Select the incorrect statement from the following:
(A) Ozone is a molecule formed by three atoms of oxygen.
(B) Ozone shields earth's surface from harmful infrared radiations.
(C) CFC's are linked to decline of layer in our atmosphere.
(D) Ozone at higher levels is a product of UV radiations acting on oxygen molecule.

Source
CBSE 2026: 31/5/3 Q5 [F4 p.528]

✓ Answer
(B) Ozone shields the earth's surface from harmful ultraviolet (not infrared) radiation.

Q121 MCQ · 1 mark ★ Board ×1 1 paper

Choose the option giving the correct matching of the items in Column I and Column II.
Column I: A. Physical environment B. Exposure to UV radiation C. Chlorofluorocarbon compounds D. Decomposers
Column II: (i) Ozone layer depletion (ii) Bacteria and fungi (iii) Abiotic components (iv) Skin cancer

(a) A–(iii), B–(i), C–(iv), D–(ii)
(b) A–(iii), B–(iv), C–(i), D–(ii)
(c) A–(iii), B–(iv), C–(ii), D–(i)
(d) A–(iii), B–(i), C–(ii), D–(iv)

Source
CBSE 2023: 31/6/3 Q10 [F9 p.42]

✓ Answer
(b) A–(iii), B–(iv), C–(i), D–(ii) — physical environment = abiotic components; UV exposure = skin cancer; CFCs = ozone layer depletion; decomposers = bacteria and fungi.

Q122 MCQ · 1 mark ★ 1 paper

The ozone layer in the upper atmosphere:

(a) keeps the amount of oxygen constant
(b) absorbs UV radiation from the sun
(c) keeps the earth warm
(d) causes acid rain

Source
Practice sample paper, set 6: Q16 [F4 p.557]

✓ Answer
(b) Absorb ultraviolet radiation.

Q123 MCQ · 1 mark ★ 1 paper

Ozone depletion has resulted in:

a) More UV radiations on earth
b) Warming of earth
c) Decrease in temperature
d) Less UV radiations on earth

Source
Practice paper [F8 p.50]: Q16 [F8 p.52]; Q16 [F8 p.58]
Also asked as:
• CBSE–SAS item Q7: "Which of these is likely to increase in humans with depletion of the ozone layer?" → D. Skin cancer.

✓ Answer
a) More UV radiations on earth.

Assertion–Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q124 **Assertion–Reason** · 1 mark ★ Board ×1 2 papers

Assertion (A): Oxygen is essential for all aerobic forms of life.
Reason (R): Free oxygen atoms combine with molecular oxygen to form ozone.

Source
CBSE 2024: 31/4/1 Q20 [F1 p.389]
KVS Lucknow PB-2 2024-25: Q17 [FM p.22]

✔ Answer
(B) Both true; R is about ozone formation and does not explain A.

Q125 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Ozone layer protects the surface of the earth from the harmful ultraviolet radiations.
Reason (R): Chlorofluorocarbons (CFCs) are responsible for the depletion of the ozone layer present at the higher levels of the atmosphere.

Source
CBSE Suppl. VI 31(B)/S (EFGH/S) (yr?): Q18 [F1 p.40]

✔ Answer
(B) Both true, but R (cause of depletion) does not explain why ozone protects the earth.

Q126 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Oxygen at the higher levels of the atmosphere is a product of UV radiation.
Reason (R): At higher levels of the atmosphere, ozone shields the surface of the Earth from UV radiation from the Sun.

Source
CBSE 2026 VI 31(B) (LMNK2): Q9 [F1 p.63]

✔ Answer
(D) A is false — it is ozone (not oxygen) at the higher levels that is a product of UV acting on oxygen; R is true.

Q127 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): Ozone (O_3) is a molecule formed by the three atoms of oxygen.
Reason (R): Ozone shields the surface of the Earth from ultraviolet (UV) radiation from the Sun.

Source
CBSE Suppl. (yr?): 31/S/1 Q20 [F4 p.195]; 31/S/2 Q20 [F4 p.251]; 31/S/3 Q19 [F4 p.307]

✔ Answer
(B) Both true; R (function) does not explain A (structure).

Q128 **Assertion–Reason** · 1 mark ★ Board ×1 1 paper

Assertion (A): The amount of ozone in the atmosphere began to drop sharply in the 1980s.
Reason (R): The oxygen atoms combine with molecular oxygen to form ozone.

Source
CBSE 2025: 31/1/1 Q20 [F9 p.194]; 31/1/2 Q18 [F9 p.235]; 31/1/3 Q17 [F9 p.278]

✓ Answer
(B) Both true; the drop in the 1980s was due to CFCs, which R does not mention.

Q129 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Ozone layer is getting depleted at upper atmosphere which is a cause of concern.
Reason (R): CFC reacts with ozone and breaks it.

Source
Bangalore Sahodaya PB-1 2024-25: Q20 [F5 p.17]

✓ Answer
(B) Both true, but R explains WHY ozone is depleted, not why the depletion is a cause of concern (more UV → skin cancer). [Lesson from pilot Q70.]

Q130 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): CFCs deplete the ozone layer.
Reason (R): CFCs are used as refrigerants and in fire extinguishers.

Source
Practice paper [F6 p.490]: Q20 [F6 p.493]; Q20 [F8 p.4]

✓ Answer
(B) Both true; the uses of CFCs do not explain how they deplete ozone. [Source key gave (a): corrected.]

Q131 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Ozone is very important layer of atmosphere.
Reason (R): Ozone protects the living organisms from harmful UV radiation of sun.

Source
Practice paper [F8 p.67]: Q20 [F8 p.69]

✓ Answer
(A) R explains A.

Q132 **Assertion–Reason** · 1 mark ★ 1 paper

Assertion (A): Ozone is both beneficial and harmful.
Reason (R): Stop the release of chlorofluorocarbons to protect the ozone layer.

Source
KVS Raipur PB-2 2025-26: Q19 [F5 p.300]; Q19 [F5 p.306]

✓ Answer
(B) A is true (poisonous at ground level, protective up high); R is a correct suggestion but does not explain A. Flag: R is an instruction, not a statement.

Very Short Answer

Q133 **Very Short Answer** · 2 marks ★★ Board ×2 5 papers

Why is damage to the ozone layer a cause for concern? What steps are being taken to limit this damage?

Source
CBSE 2023: 31/1/3 Q25 [F1 p.164]
CBSE old paper (Series RHB/1, 31/1/1) (pre-2020, yr?): Q4 [F6 p.170]
KVS Lucknow PB-1 2024-25: Q25 [FM p.31]
Practice paper [F6 p.273]: Q11 [F6 p.274]
Practice sample paper, set 6: Q28 [F4 p.558]
NCERT: NCERT Exercise Q9
Also asked as:
• KVS Lucknow PB-1 2024-25 Q25: "a) How is ozone formed in the higher level of the atmosphere? b) Damage to ozone layer is a cause of concern. Justify."
• practice set 6 Q28: "How can ozone depletion be controlled? Name one international agreement related to controlling ozone depletion."
• Old CBSE (RHB/1) Q4 (1 mark): "Why did United Nations act to control the production of chlorofluorocarbons (CFCs) used in refrigerators?" → CFCs deplete the ozone layer, which shields the earth from UV radiation.

✓ Answer
• Ozone shields the earth from UV radiation; its damage lets more UV reach the earth, which causes skin cancer and harms organisms (1).
• In 1987 UNEP forged an agreement among nations to freeze CFC production at 1986 levels; now CFC-free refrigerators etc. are used (1).

Q134 **Very Short Answer** · 2 marks ★★ Board ×3 4 papers

(a) Explain the role of UV radiation in the formation of ozone layer.
(b) Why is UV radiation considered as highly damaging to organisms?

Source
CBSE 2026: 31/4/2 Q12 [F4 p.404]
CBSE 2026: 31/8/1 Q13 [F4 p.97]
CBSE old paper (Series BRH, 31/1) (pre-2020, yr?): Q3 [F6 p.209]
Practice paper [F6 p.430]: Q11 [F6 p.431]
Also asked as:
• 2026 (31/8/1) Q13 (3 marks): "What role does UV radiation play in the formation of the ozone layer? Explain the process with relevant chemical reactions. Why is the excessive use of CFCs a cause of concern for organisms?" — add (1): CFCs deplete the ozone layer, letting more UV reach the earth.
• Practice paper: "a. Explain the role of UV radiation in producing ozone layer. b. Mention the reaction involved. c. Why is excessive use of CFCs a cause of concern?"
• CBSE–SAS item Q6: "What is the role of ultraviolet (UV) rays in the reaction?" → splitting oxygen molecules into free oxygen atoms.
• Old CBSE (BRH, 31/1) Q3 (1 mark): "What happens when higher energy ultraviolet radiations act on the oxygen at the higher level of the atmosphere?" → O_2 splits into O atoms, which combine with O_2 to form ozone (O_3).

✓ Answer
(a) The higher energy UV radiations split apart some molecular oxygen (O_2) into free oxygen (O) atoms; these atoms combine with molecular oxygen to form ozone: $O_2 \rightarrow O + O$ (UV); $O + O_2 \rightarrow O_3$ (1).
(b) UV radiation causes skin cancer in human beings and damages other organisms (1).

Q135 **Very Short Answer** · 2 marks ★ Board ×2 2 papers

"Ozone, although a deadly poison, performs an essential function for the life on the earth." Justify this statement.

Source
CBSE Suppl. VI 31(B)/S (CDBA/S) (yr?): Q21 [F1 p.13]
CBSE 2023: 31/2/3 Q26 [F1 p.246]

✓ Answer
• Ozone (O_3) is a deadly poison (½).
• At the higher levels of the atmosphere ozone shields the surface of the earth from ultraviolet (UV) radiation from the Sun (1).
• UV radiation is highly damaging to organisms, e.g. it causes skin cancer in human beings (½).

Q136 **Very Short Answer** · 2 marks ★ Board ×2 2 papers

(i) State the essential function performed by ozone at the higher levels of the atmosphere.
(ii) Why was there a sharp drop in the amount of ozone in the atmosphere in 1980's?

Source
CBSE 2023: 31/4/2 Q21 [F1 p.416]
CBSE old paper (Series BRH/2, 31/2/1) (pre-2020, yr?): Q3 [F5 p.576]
Also asked as:
• Old CBSE (BRH/2) Q3 (1 mark): "What is the function of ozone at the higher level of atmosphere?" → it shields the earth from UV radiation of the Sun.

✓ Answer
(i) It shields the surface of the earth from UV radiation from the Sun (1).
(ii) Due to synthetic chemicals like chlorofluorocarbons (CFCs) used as refrigerants and in fire extinguishers (1).

Q137 **Very Short Answer** · 2 marks ★ Board ×1 2 papers

What is ozone? How is it formed in the upper layers of the atmosphere? How does ozone affect our ecosystem?

Source
CBSE 2022 Term-II: 31/1/1 Q7 [F9 p.170]; 31/1/2 Q1 [F9 p.211]; 31/1/3 Q6 [F9 p.256]
Practice paper [F8 p.67]: Q25 [F8 p.70]
NCERT: NCERT in-text: "What is ozone and how does it affect any ecosystem?"
Also asked as:
• Practice paper Q25: "What is ozone? Show the reactions of formation of ozone from oxygen in the atmosphere? Name the pollutant and its role in depletion of ozone layer."

✓ Answer
• Ozone (O_3) is a molecule formed by three atoms of oxygen (½).
• UV radiation splits O_2 into free O atoms, which combine with O_2 to form O_3 (1).
• It shields the earth from harmful UV radiation, protecting living organisms (½).

Q138 **Very Short Answer** · 2 marks ★ 1 paper

Which chemical is used in fire extinguishers? It is harmful as it leads to depletion of ozone layer, thus allowing UV radiations from the Sun to enter into the atmosphere.

Source
Practice paper [F8 p.34]: Q25 [F8 p.37]

✓ Answer
Chlorofluorocarbons (CFCs) (1); they deplete the ozone layer, so more UV reaches the earth and causes skin cancer (1).

Short Answer

Q139 **Short Answer** · 3 marks ★★★ Board ×2 7 papers

Write the essential function performed by ozone at the higher levels of the atmosphere. How is it formed in the upper atmosphere? Write the name of the group of chemicals mainly responsible for the depletion of ozone layer.

Source
CBSE 2025: 31/2/1 Q33 [F9 p.354]; 31/2/2 Q33 [F9 p.424]
CBSE 2026: 31/7/1 Q10 [F4 p.36]
KVS Lucknow PB-II 2023-24: Q33 [FM p.38]
KVS Lucknow Set-1 (year n.p.): Q27 [FM p.49]
Bangalore Sahodaya PB-1 2025-26: Q10 [F5 p.547]
Practice paper [F8 p.34]: Q25 [F8 p.38]
Practice paper [F6 p.257]: Q11 [F6 p.258]; Q11 [F6 p.290]
Also asked as:
• 2026 (31/7/1) Q10 (2 marks): "How is ozone layer formed in our atmosphere? State one important role of ozone in our atmosphere. What is responsible for its depletion?"
• KVS Lucknow PB-II 2023-24 Q33: "How is ozone formed in the upper atmosphere? Why is the damage of ozone layer a cause of concern to us? State cause of this damage."
• KVS Lucknow PB Q27 / practice papers: "How is ozone formed in upper atmosphere? State its importance. What is responsible for its depletion? Write one harmful effect for ozone depletion." (+ skin cancer)
• Practice paper OR: "a. State one important function of ozone layer at the higher level. b. How is ozone formed? c. Name the compound responsible for ozone depletion."

✓ Answer
• Function: shields the surface of the earth from ultraviolet (UV) radiation from the Sun (1).
• Formation: higher energy UV radiations split apart some molecular oxygen into free oxygen atoms; these combine with molecular oxygen to form ozone — $O_2 \rightarrow O + O$; $O + O_2 \rightarrow O_3$ (1).
• Chlorofluorocarbons (CFCs) (1).

Long Answer

Q140 **Long Answer** · 5 marks NEW

[NEW] (a) How is ozone formed at the higher levels of the atmosphere? Write the reactions. (b) Why is ozone called a deadly poison and yet useful? (c) Name the chemicals responsible for ozone depletion and state two of their uses. (d) What step did UNEP take in 1987? (e) Why is the depletion a cause for concern?

Source [NEW] — gap-filler, not from a paper.

✔ Answer
(a) UV splits $O_2 \rightarrow O + O$; $O + O_2 \rightarrow O_3$ (1).
(b) Poisonous at ground level; at higher levels it shields the earth from UV (1).
(c) Chlorofluorocarbons (CFCs); used as refrigerants and in fire extinguishers (1).
(d) Agreement to freeze CFC production at 1986 levels (1).
(e) More UV reaches the earth — skin cancer and harm to organisms (1).

Case / Source-based

Q141 **Case / Source-based** · 4 marks ★ 1 paper

Polar stratospheric clouds (PSCs), long known to play an important role in Antarctic ozone destruction, are occurring with increasing frequency in the Arctic... (a) How is ozone formed in the outer atmosphere? (b) Ozone formation is also a continuous process. Why is there a depletion in the ozone layer still? (c) What can be a positive effect of global warming on the depletion of the ozone layer? (d) How does ozone layer depletion impact human health?

Source
CBSE Competency-Based Qs, chapter-wise: Q8 [F4 p.811]

✔ Answer
(a) UV splits O_2 into O atoms; $O + O_2 \rightarrow O_3$ (1). (b) Rate of destruction is higher than the rate of formation (1). (c) Rise in polar temperature may stop PSCs forming and reduce depletion (1). (d) More UV reaches the earth — skin cancer (1). (Official key.)

⚠ **Note:** Part (c) goes beyond the NCERT text — treat as enrichment.

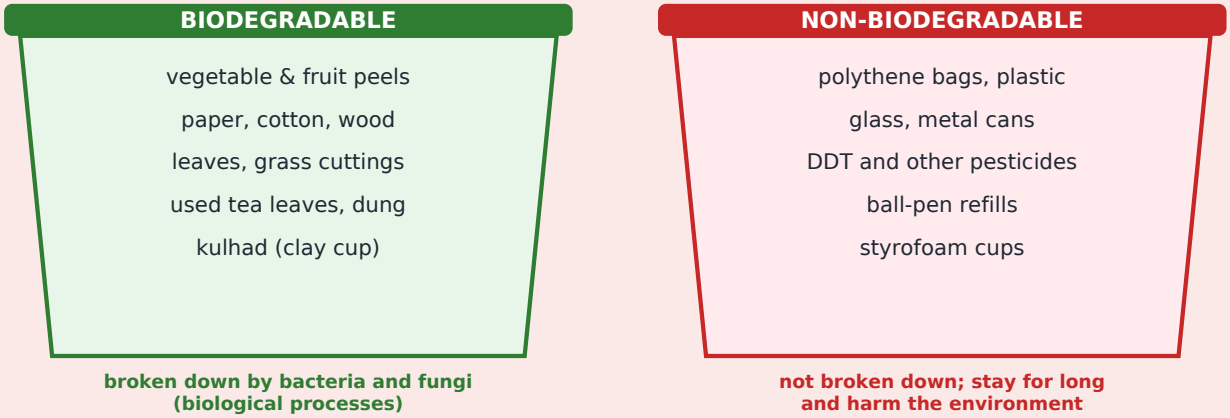
T3 How our activities affect the environment

3B. Managing the garbage we produce

32 questions asked in **34** papers
15 board papers
Prepared by Abhishek Das, TGT (Science)

Picture it — revise with this diagram before you start

Fig 8. Managing garbage — sort your waste



MCQ

Q142 MCQ · 1 mark ★★ 3 papers

In the following groups of materials, which group(s) contains only non-biodegradable items? i. Wood, paper, leather ii. Polythene, detergent, PVC iii. Plastic, detergent, grass iv. Plastic, bakelite, DDT

Source
KVS Ahmedabad PB 2025-26: Q6 [F9 p.505]; Q4 [F9 p.517]
Practice paper [F6 p.490]: Q16 [F6 p.492]; Q16 [F8 p.3]
Practice paper [F8 p.82]: Q15 [F8 p.84]; Q16 [F8 p.91]
Also asked as:
• Practice paper: options a) Polythene, Detergent, PVC b) Wood, Paper, Leather c) Plastic, Detergent, Grass d) Plastic, Bakelite, Cloth → a.

✔ Answer
(ii) and (iv).

Q143 MCQ · 1 mark ★ Board ×1 2 papers

Some wastes are given below: (i) Garden waste (ii) Ball point pen refills (iii) Empty medicine bottles made of glass (iv) Peels of fruits and vegetables (v) Old cotton shirt. The non-biodegradable wastes among these are:

(A) (i) and (ii)
(B) (ii) and (iii)
(C) (i), (iv) and (v)
(D) (i), (iii) and (iv)

Source
CBSE 2024: 31/4/1 Q16 [F1 p.387]
Practice paper [F6 p.322]: Q3 [F6 p.322]; Q3 [F6 p.338]

✔ Answer
(B) (ii) and (iii).

Q144 MCQ · 1 mark ★ 2 papers

Which of the following human activities has resulted in an increase of non-biodegradable substances?

A. Organic farming
B. Increase in tree plantation
C. Use of plastic as packaging material
D. Composting of kitchen waste

Source
CBSE SQP 2025-26 (copy): Q7 [F5 p.283]; Q7 [F6 p.227]; Q7 [F8 p.305]
ALLEN Sample Paper 2025-26: Q7 [F8 p.334–349]

✓ Answer
C. Use of plastic as packaging material. (Official SQP key.)

Q145 MCQ · 1 mark ★ 2 papers

Alisha digs a pit in her garden and puts the following items in it: paper cups, glass bowls, fruit peels, rubber slippers. She then covers the pit with soil. Which item will decompose first?

Source
CBSE–SAS Competency Test Items (2021): Q8 [F5 p.439]
Practice paper [F8 p.18]: Q25 [F8 p.21]; Q25 [F8 p.22]

✓ Answer
Fruit peels. (Official CBSE–SAS key.)

Q146 MCQ · 1 mark ★ Board ×1 1 paper

Amongst the following groups of materials the group which contains only biodegradable materials is

(A) Polythene, Soap, Wool
(B) Plastic, Leather, Grass
(C) Glass, Aluminium, Neem leaves
(D) Wood, Leather, Paper

Source
CBSE Suppl. (yr?): 31/S/3 Q15 [F4 p.305]

✓ Answer
(D) Wood, Leather, Paper.

Q147 MCQ · 1 mark ★ Board ×1 1 paper

In the following groups of wastes, which group contains only non-biodegradable wastes?
(A) Leather footwear, Plastic plate, Polythene bag
(B) Empty medicine bottle, Milk packet, Aluminium can
(C) Used tea leaves, Cardboard box, Iron nail
(D) Plastic Syringes, Newspaper, Ball point pen

Source
CBSE 2025: 31/6/3 Q15 [F4 p.11]

✓ Answer
(B) Empty medicine bottle, milk packet (plastic), aluminium can — none are broken down by micro-organisms.

Q148 MCQ · 1 mark ★ Board ×1 1 paper

Identify from the following a group containing all non-biodegradable substances.

(A) Leather, Glass, Plastic
(B) Cotton, Wood, Nylon
(C) DDT, Polyester, Glass
(D) Leather, Silk, Wool

Source
CBSE 2025: 31/2/1 Q16 [F9 p.348]; 31/2/2 Q16 [F9 p.416]; 31/2/3 Q16 [F9 p.488]

✔ Answer
(C) DDT, Polyester, Glass.

Q149 MCQ · 1 mark ★ Board ×1 1 paper

Which of the following is a non-biodegradable pollutant?

(A) Paper
(B) DDT
(C) Wood
(D) Vegetable peel

Source
CBSE 2026: 31/5/1 Q6 [F4 p.464]; 31/5/2 Q5 [F4 p.496]; 31/5/3 Q2 [F4 p.526]

✔ Answer
(B) DDT.

Q150 MCQ · 1 mark ★ Board ×1 1 paper

Consider the following groups: i. Cotton, silk, nylon, leather ii. Wool, wood, soap, wheat iii. Banana, cat, rat, tree iv. Soap, detergent, silk, polyester. The groups of biodegradable material are:

(A) i, ii and iii
(B) ii, iii and iv
(C) i and iv
(D) ii and iii

Source
CBSE VI 31(B) (code 11-31(B)) (yr?): Q16 [F9 p.131]

✔ Answer
(D) ii and iii — (i) has nylon, (iv) has detergent and polyester (non-biodegradable).

Q151 MCQ · 1 mark ★ Board ×1 1 paper

Given below are some of the statements regarding our environment: (i) Change in our life-styles have resulted in greater amounts of waste material generation. (ii) Changes in attitude have resulted in use of more disposable things. (iii) Changes in packaging has resulted in much of our waste becoming non-biodegradable. (iv) Organic farming. Which amongst these is not leading to any damage of environment?

Source
CBSE 2026: 31/4/1 Q3 [F4 p.368]; 31/4/2 Q3 [F4 p.398]; 31/4/3 Q3 [F4 p.430]

✔ Answer
Only (iv) Organic farming — option (B).

⚠ **Note:** OCR options partly garbled; (B) reads "(iv)".

Q152 MCQ · 1 mark ★ Board ×1 1 paper

Which one of the following statements is incorrect about the effect on our environment as a result of our activities?

(A) Improvement in our lifestyle has resulted in greater amounts of waste.
(B) Packaging of materials has resulted in lesser amount of non-biodegradable waste.
(C) Use of disposable cups/kulhads results in loss of fertile topsoil.
(D) Harmful wastes that are non-biodegradable persist in the environment for a long time.

Source
CBSE Suppl. EFGH/S (yr?): 31/S/1 Q16 [F4 p.222]; 31/S/2 Q16 [F4 p.276]

✔ Answer
(B) Packaging has resulted in MORE (not less) non-biodegradable waste.

Q153 MCQ · 1 mark ★ Board ×1 1 paper

The reasons for excessive generation of wastes are: (i) Use and throw policy. (ii) Increased availability of packaged food. (iii) Increased construction wastes. (iv) Non-sorting of dry and wet wastes.

Source
CBSE 2026: 31/5/2 Q7 [F4 p.496]

✔ Answer
Statements (i), (ii) and (iii). Non-sorting of dry and wet waste does not increase the amount of waste; it makes disposal harder.

⚠ **Note:** Options unreadable in OCR; flagged — check the printed paper.

Q154 MCQ · 1 mark ★ 1 paper

Which of the following groups contain only biodegradable items?

(a) Grass, flowers and leather
(b) Grass, wood and plastic
(c) Fruit-peels, cake and lime-juice
(d) Cake, wood and grass

Source
Practice paper [F6 p.474]: Q16 [F6 p.476]
NCERT: NCERT Exercise Q1

✔ Answer
(a), (c) and (d) — all items in these are broken down by micro-organisms; (b) has plastic.

Q155 MCQ · 1 mark ★ 1 paper

Some waste products are listed: Grass cutting, Polythene bag, Plastic toys, Used tea bags, Old clothes, Paper straw. Which group of waste materials can be classified as non-biodegradable?

Source
KVS Delhi PB-II 2024-25: Q15 [FM p.88]

✔ Answer
a) Polythene bags, plastic toys.

Q156 MCQ · 1 mark ★ 1 paper

Which of the following are environment-friendly practices?
(a) Carrying cloth-bag to put purchases in while shopping
(b) Switching off unnecessary lights and fans
(c) Walking to school instead of getting your mother to drop you on her scooter
(d) All of the above

Source
Practice paper [F8 p.99]: Q16 [F8 p.101]
NCERT: NCERT Exercise Q3

✔ Answer
(d) All of these.

Q157 MCQ · 1 mark ★ 1 paper

Compostable plastics are biodegradable in conditions conducive to composting. Other biodegradable plastics degrade when buried in the soil. Which of the following statements is likely to be true? P) Compostable is always biodegradable. Q) Biodegradable is not always compostable.

A. Only P
B. Only Q
C. Both P and Q
D. Neither P nor Q

Source
CBSE CFPQ (Competency Focused Practice Qs): Q165 [F6 p.91]

✔ Answer
C. Both P and Q. (Official CFPQ key.)

Q158 **MCQ** · 1 mark ★ 1 paper

Which of the following lifestyle changes will have a positive impact on the environment? (Picture: A – separate bins for glass and organic waste; B – garbage dumped in bags; C – factory smoke; D – sewage flowing into water; E – plastic bag ✗, paper bag ✓)

(a) B and C
(b) C and D
(c) A and E
(d) A and D

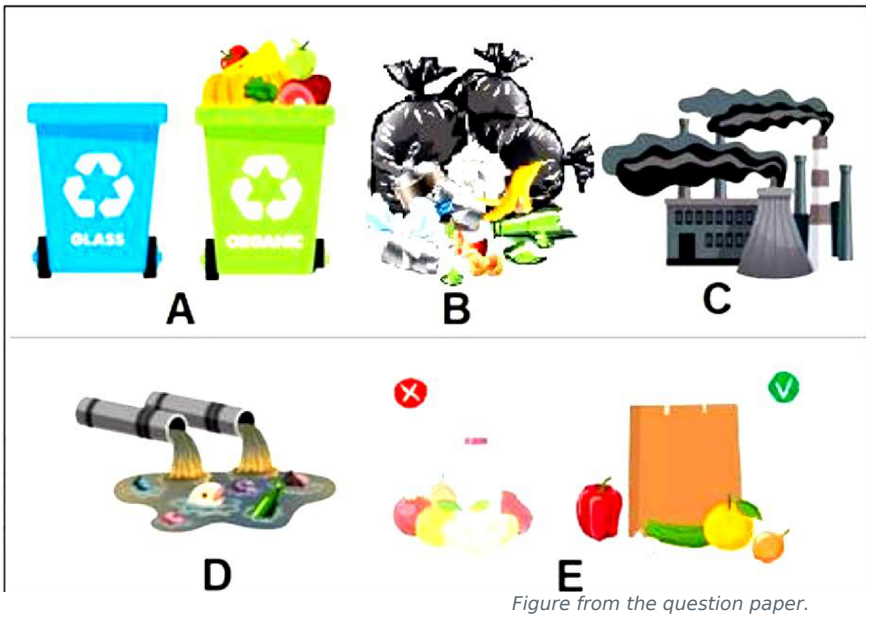


Figure from the question paper.

Source
Sample Question Paper-11 (Class X, 2024-25): Q16 [F8 p.131–303]

✓ Answer
(c) A and E — sorting/recycling waste and using paper bags instead of plastic bags are eco-friendly; B, C and D harm the environment.

Q159 **MCQ** · 1 mark ★ 1 paper

The given graph shows the amount of urban waste — generated, treated and dumped (in percentage). Identify the reason for the low success rate of the waste management process.

(a) Only 15% of urban India's waste is processed.
(b) Less than 60% of waste is collected from households.
(c) More than 60% of waste is collected from households.
(d) Both (a) and (b)

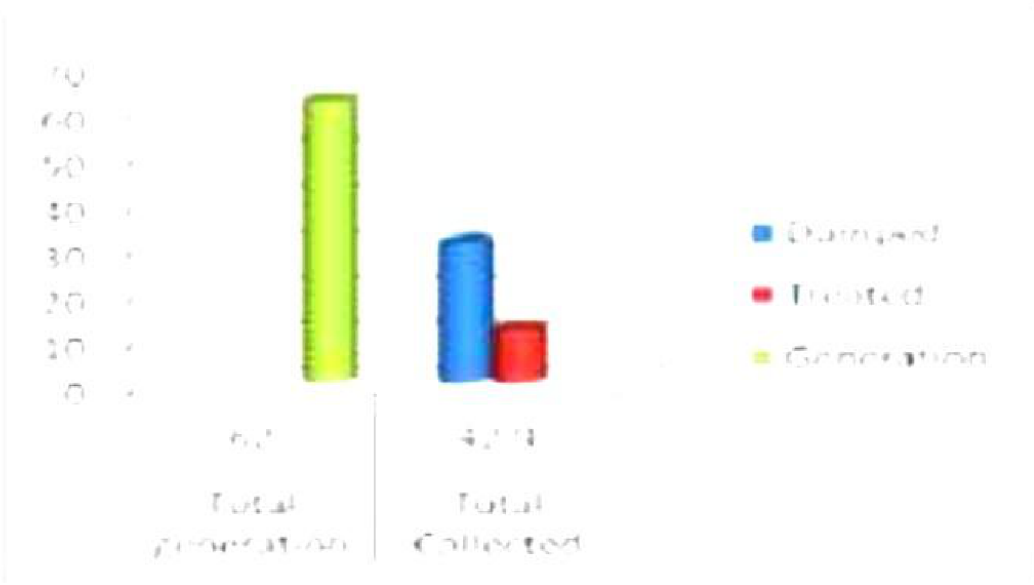


Figure from the question paper.

Source
Sample Question Paper-16 (Class X, 2024-25): Q16 [F8 p.131–303]

✓ Answer
(d) Both (a) and (b) — only about 15% of urban waste is processed and less than 60% is collected from households.

Assertion-Reason

Options for every A–R question: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true, but R is not the correct explanation of A. (C) A is true, but R is false. (D) A is false, but R is true.

Q160 **Assertion-Reason** · 1 mark ★ Board ×1 2 papers

Assertion (A): The waste we generate daily may be biodegradable or non-biodegradable.
Reason (R): The waste generated, if not disposed off properly may cause serious environmental problems.

Source
CBSE 2024: 31/3/1 Q20 [F1 p.273]
Practice paper [F6 p.322]: Q9 [F6 p.323]; Q9 [F6 p.339]

✓ Answer
(B) Both true; R (effect of poor disposal) does not explain the two kinds of waste.

Q161 **Assertion-Reason** · 1 mark ★ 1 paper

Assertion (A): Biodegradable substances result in the formation of compost and natural replenishment.
Reason (R): It is due to breakdown of complex organic substances into simple inorganic substances.

Source
KVS Ahmedabad PB 2025-26: Q9 [F9 p.506]; Q8 [F9 p.518]
Also asked as:
• KVS Lucknow PB-1 2024-25 Q20 prints R as "...breakdown of complex INORGANIC substances into simple ORGANIC substances" → then R is false: answer (C). Read the reason carefully.

✓ Answer
(A) R explains A.

Very Short Answer

Q162 **Very Short Answer** · 2 marks ★★ Board ×2 4 papers

Define the terms biodegradable and non-biodegradable substance. Classify the following items into these two categories: Newspapers, Glass bottles, Polythene bags, Vegetable peels.

Source
CBSE 2024: 31/3/2 Q26 [F1 p.307]
CBSE 2023: 31/5/3 Q25 [F1 p.524]
Practice sample paper, set 6: Q25 [F4 p.558]
Practice sample paper, set 7: Q24 [F4 p.671]
NCERT: NCERT in-text: "Why are some substances biodegradable and some non-biodegradable?"
Also asked as:
• 2023 (31/5/3) Q25: "What is the difference between biodegradable and non-biodegradable substances? List two methods of safe disposal of biodegradable domestic waste." → composting/compost pit, vermicomposting, biogas.
• practice sets 6, 7: "State/List two differences between biodegradable and non-biodegradable substances."

✓ Answer
• Substances that are broken down by biological processes (micro-organisms) are biodegradable; those that are not broken down by biological processes are non-biodegradable (½+½).
• Biodegradable: newspapers, vegetable peels (½). Non-biodegradable: glass bottles, polythene bags (½).

Q163 **Very Short Answer** · 2 marks ★ 2 papers

Kulhads (disposable cups made of clay) and disposable paper cups both are used as an alternative for disposable plastic cups. Which one of these two can be considered as a better alternative to plastic cups and why?

Source
CBSE CFPQ (Competency Focused Practice Qs): Q168 [F6 p.92]
Practice paper [F6 p.354]: Q11 [F6 p.355]
NCERT: NCERT text box — disposable plastic cups in trains replaced by kulhads, then by paper cups
Also asked as:
• CFPQ Q168: "On an overnight train journey Varun found tea being served in various kinds of cups. (a) Which kind of tea cup is most harmful for the environment and why? (b) Which one is made from the most environment friendly material and why?" → (a) plastic — non-biodegradable; (b) earthen cups — made from natural material. (Official key.)
• Practice paper: "What is meant by garbage? List two classes into which garbage is classified."

✓ Answer
• Disposable paper cups (1).
• Making kulhads on a large scale results in the loss of fertile top-soil; paper cups are biodegradable (1).

Q164 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

Give any two ways in which non-biodegradable substances would affect the environment adversely.

Source
CBSE 2026 VI 31(B) (E7FDG/5): Q10 [F9 p.73]
NCERT: NCERT in-text: "Give any two ways in which non-biodegradable substances would affect the environment."; NCERT Exercise Q7: "What are the problems caused by the non-biodegradable wastes that we generate?"

✓ Answer
• They are not broken down, persist in the environment for a long time and pollute soil and water (1).
• They enter food chains and get accumulated (biological magnification); plastics block drains and harm animals that eat them (1).

Q165 **Very Short Answer** · 2 marks ★ Board ×1 1 paper

State two reasons why human-made materials like plastics persist for a long time in the environment.

Source
CBSE 2023: 31/5/2 Q21 [F1 p.493]

✓ Answer
• They are not broken down by biological processes (micro-organisms/enzymes cannot act on them) (1).
• They are inert (chemically not reactive), so they remain for a long time (1).

Q166 **Very Short Answer** · 1 mark ★ Board ×1 1 paper

Why should biodegradable and non-biodegradable wastes be discarded in two separate dust bins?

Source
CBSE old paper (Series RSH/1, 31/1/1) (pre-2020, yr?): Q3 [F6 p.107]

✓ Answer
Biodegradable waste can be broken down by decomposers (e.g. into compost), while non-biodegradable waste (plastic, glass, metal) must be recycled or disposed of in other ways; keeping them separate makes both easy (1).

Q167 **Very Short Answer** · 1 mark ★ 1 paper

Ritu bought two sets of single-use disposable cups. One of them is made of Styrofoam (thermocol), which is obtained from petroleum products. The other one is made of sugarcane waste. Which of them is likely to remain in the environment or landfill longer? Why?

Source
CBSE CFPQ (Competency Focused Practice Qs): Q171 [F6 p.93]
Also asked as:
• CFPQ Q179: plastics from petroleum vs from corn starch — petroleum plastic is non-biodegradable, plant-based is biodegradable.
• CFPQ Q180: palm-leaf vs paper straws — both biodegradable; palm leaves need no factory processing.
• CFPQ Q118: cow eating plastic — cows do not produce the enzyme to break down plastic.

✓ Answer
Styrofoam — it is not biodegradable (½+½). (Official CFPQ key.)

Q168 **Very Short Answer** · 1 mark ★ 1 paper

Arrange the four objects — bone, metal can, paper sheet, plastic bottle — according to the time they take to get biodegraded (LEAST time TO MOST time).

Source
CBSE Competency-Based Qs, chapter-wise: Q6 [F4 p.810]

✓ Answer
Paper sheet, bone, metal can, plastic bottle (1). (Official key.)

Short Answer

Q169 **Short Answer** · 3 marks ★ Board ×1 1 paper

Write one difference between biodegradable and non-biodegradable wastes. List two impacts of each type of the accumulated waste on environment if not disposed off properly.

Source
CBSE 2023: 31/4/1 Q33 [F1 p.371]; 31/4/2 Q27 [F1 p.418]; 31/4/3 Q32 [F1 p.444]
NCERT: NCERT in-text: "Give any two ways in which biodegradable substances would affect the environment."; NCERT Exercise Q8: "If all the waste we generate is biodegradable, will this have no impact on the environment?"

✓ Answer
• Biodegradable wastes are broken down by micro-organisms; non-biodegradable wastes are not (1).
• Biodegradable (accumulated): bad smell and breeding of flies/mosquitoes; spread of diseases (1).
• Non-biodegradable: pollute soil and water for a long time; enter food chains (biological magnification) / block drains (1).

Q170 **Short Answer** · 3 marks ★ Board ×1 1 paper

(a) Mention any one harmful effect of using plastic bags on the environment. Suggest better alternatives to the usage of plastic bags.
(b) Paddy fields require a large amount of water. The pesticides and chemical fertilizers used are washed down into the soil or waterbodies. How do these chemicals reach our bodies? What is this phenomenon known as?

Source
CBSE 2026: 31/5/1 Q14 [F4 p.468]; 31/5/2 Q13 [F4 p.500]; 31/5/3 Q13 [F4 p.532]
NCERT: NCERT in-text: "How can you help in reducing the problem of waste disposal? Give any two methods."
Also asked as:
• Practice paper (2 marks): "i. Write two harmful effects of using plastic bags on the environment. Suggest alternatives. ii. List any two practices that can be followed to dispose off the waste produced in our homes." → compost pit, segregation of biodegradable and non-biodegradable waste.

✓ Answer
(a) Plastic bags are non-biodegradable — they persist, block drains and harm animals that eat them (½); use cloth/jute/paper bags (½).
(b) The chemicals are absorbed by plants and aquatic organisms, enter the food chain and get accumulated at each level; we eat these plants/animals and get the most (1½); biological magnification (½).

Q171 **Short Answer** · 3 marks ★ Board ×1 1 paper

(a) Improper waste disposal is a curse to the environment. Explain.
(b) Why are crop fields considered as artificial ecosystems?
(c) Farmers are using pesticides on the crop plants, but the chances of accumulation of harmful chemicals is greatest in human beings. Why? Name the phenomenon.

Source
CBSE 2026: 31/7/1 Q14 [F4 p.37]; 31/7/2 Q13 [F4 p.52]; 31/7/3 Q13 [F4 p.70]

✔ Answer
(a) Wastes that are not disposed properly pollute soil and water, spread diseases; non-biodegradable wastes persist and harm organisms (1).
(b) Crop fields are made and maintained by human beings (crop, water, fertiliser chosen by us) (1).
(c) Humans are at the top level of the food chain, so the chemicals accumulated at each level reach the maximum in us; biological magnification (½+½).

Q172 **Short Answer** · 3 marks ★ Board ×1 1 paper

(A) If there are no decomposers in an ecosystem, what will happen to the garbage and dead animal and plant wastes?
(B) As a student, what are the four changes in your daily habits you would adopt to reduce generation of non-biodegradable wastes?

Source
CBSE 2026: 31/8/3 Q14 [F4 p.163]

✔ Answer
(A) Garbage and dead remains will not be broken down; they will pile up, and nutrients will not return to the soil (1).
(B) Any four (½ each): carry a cloth/jute bag; refuse single-use plastic straws/cups/plates; use a steel water bottle and lunch box; separate biodegradable and non-biodegradable waste; buy things with less packaging; reuse paper/notebooks.

Long Answer

Q173 **Long Answer** · 5 marks ★ 1 paper

Suggest any five activities in daily life which are eco-friendly. OR Explain some harmful effects of agricultural practices on the environment.

Source
NCERT Exemplar Sample Paper-II: Q36 [F5 p.245]

✔ Answer
Any five (1 each): separate biodegradable and non-biodegradable waste; make a compost pit/gardening; use jute/cloth/paper bags in place of polythene; use compost instead of chemical fertilisers; save water/rain-water harvesting; switch off lights and fans.
OR (1 each): excessive fertilisers change soil chemistry and kill useful microbes; non-biodegradable pesticides cause biological magnification; extensive cropping reduces soil fertility; over-use of ground water lowers the water table; damage to natural ecosystems/habitats. (Exemplar hint.)

1. Summary table — sub-theme × question type

Sub-theme	MCQ	AR	VSA	SA	LA	CBQ	Total
1A. What is an ecosystem — components; natural and artificial ecosystems	7	4	4	2	–	1	**18**
1B. Decomposers	3	1	1	1	–	–	**6**
2A. Food chains and trophic levels	11	3	9	2	–	–	**25**
2B. Flow of energy — 1% and 10% law (with numericals)	14	8	9	4	1	1	**37**
2C. Food web	2	1	4	–	–	1	**8**
2D. Biological magnification	4	4	8	3	–	1	**20**
3A. Ozone layer and how it is getting depleted	9	9	6	1	1	1	**27**
3B. Managing the garbage we produce	18	2	7	4	1	–	**32**
Total	**68**	**32**	**48**	**17**	**3**	**5**	**173**

Long-answer (5-mark) questions from Ch 13 are rare in the papers (only one, from the NCERT Exemplar sample paper); two [NEW] 5-mark questions are added for practice.

2. Top 10 most repeated questions

#	Q no.	Question	Papers	Board
1	Q23	List two reasons to show that the existence of decomposers is essential in an ecosystem.	14	7
2	Q111	Explain how some harmful chemicals enter our bodies through the food chain. Why is the concentration of these harmful chemicals found to be maximum in human bei	10	10
3	Q139	Write the essential function performed by ozone at the higher levels of the atmosphere. How is it formed in the upper atmosphere? Write the name of the group of	7	2
4	Q72	Describe why food chains generally consist of a few steps.	6	4
5	Q87	Food web is constituted by	6	0
6	Q103	How do harmful chemicals get accumulated progressively at each trophic level in a food chain?	5	2
7	Q133	Why is damage to the ozone layer a cause for concern? What steps are being taken to limit this damage?	5	2
8	Q134	(a) Explain the role of UV radiation in the formation of ozone layer.	4	3
9	Q162	Define the terms biodegradable and non-biodegradable substance. Classify the following items into these two categories: Newspapers, Glass bottles, Polythene bag	4	2
10	Q25	Select from the following, a food chain in which the organism of the second trophic level is missing:	4	1

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Top Questions of the Book

The 5 most asked questions of every chapter — learn these first

Chapter 5 · Life Processes

chapter starts on page 1

#	Q	Question	Type	Board	Papers	Page
1	Q119	Briefly mention the steps in double circulation through human heart.	VSA	×3	8	39
2	Q10	Opening and closing of stomata is due to :	MCQ	×3	4	6
3	Q53	Write two roles each of (i) bile juice and bile salts and (ii) pancreatic enzymes in the process of digestion.	VSA	×3	4	19
4	Q120	(a) Why is it important to prevent oxygenated and deoxygenated blood from mixing in birds and mammals? (b) Which...	VSA	×2	3	39
5	Q162	Explain in brief two ways by which leaves of a plant help in excretion.	VSA	×2	3	52

Chapter 6 · Control and Coordination

chapter starts on page 54

#	Q	Question	Type	Board	Papers	Page
6	Q112	(a) Where are auxins synthesised? How are they related to phototropism? OR (b) There is a hormone which ...	VSA	×6	7	100
7	Q154	Name the hormone released and the gland which secretes it in human beings during scary situations. How does ...	SA	×5	5	113
8	Q68	(a) Electrical impulses are an excellent means to respond to stimuli in animal bodies. List any two ...	VSA	×4	4	81
9	Q101	A plant growth inhibitor hormone which causes wilting of leaves is called :	MCQ	×3	4	97
10	Q71	(a) List two constituents of Central Nervous System (CNS). How are these components protected? (b) Write two ...	SA	×2	5	82

Chapter 7 · How do Organisms Reproduce?

chapter starts on page 124

#	Q	Question	Type	Board	Papers	Page
11	A68	What is pollination? Differentiate between self-pollination and cross-pollination.	VSA	×7	12	154
12	A36	What is vegetative propagation ? List its two advantages.	VSA	×4	6	141
13	Q76	Write two examples each of sexually transmitted diseases caused by (i) virus, (ii) bacteria. Explain how the transmissio...	SA	×4	6	199
14	A77	(i) In flowering plants, the process of pollination leads to fertilization. Explain with the help of a well-labelled diagram how the male germ cell from the pollen grain	LA	×4	5	157
15	A8	Write two differences between binary fission and multiple fission in a tabular form, giving one example of each.	VSA	×2	5	130

Chapter 8 · Heredity

chapter starts on page 204

#	Q	Question	Type	Board	Papers	Page
16	Q75	“The sex of the children in the human beings will be determined by what they inherit from their father.” Explain / justify this statement.	SA	×2	5	235
17	Q20	What is meant by the terms (I) dominant, and (II) recessive traits? Explain.	VSA	×3	4	216
18	Q46	In one of his famous experiments of tracing the inheritance of traits when Mendel cross-pollinated a pure tall pea plant with a pure dwarf pea plant, he got only tall pea plants in the F1 generation. ...	Case	×2	4	224

Chapter 8 · Heredity (continued)

#	Q	Question	Type	Board	Papers	Page
19	Q55	In order to trace the inheritance of traits Mendel crossed pea plants having one contrasting character or a pair of contrasting characters. ...	Case	×2	3	228
20	Q23	In a cross between two tall pea plants a few dwarf pea plants were also obtained in F1 generation. It is possible only if the gene combination of the parental plants is:	MCQ	×2	2	217

Chapter 13 · Our Environment

chapter starts on page 239

#	Q	Question	Type	Board	Papers	Page
21	Q111	Explain how some harmful chemicals enter our bodies through the food chain. Why is the concentration of these harmful chemicals found to be maximum...	SA	×10	10	287
22	Q23	List two reasons to show that the existence of decomposers is essential in an ecosystem.	VSA	×7	14	252
23	Q72	Describe why food chains generally consist of a few steps.	VSA	×4	6	269
24	Q134	(a) Explain the role of UV radiation in the formation of ozone layer.	VSA	×3	4	294
25	Q12	We do not clean ponds or lakes, but an aquarium needs to be cleaned regularly. Why?	VSA	×3	3	247

Tap a row to jump to the question and its answer.

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Revision Checklist

Tick each box when it is done. Go back to any theme with a blank box.

Ch 5 · Life Processes		Read NCERT	Solved Qs	Diagrams	Revised ★
Life processes and modes of nutrition	p. 4	☐	☐	☐	☐
Photosynthesis and stomata	p. 6	☐	☐	☐	☐
Nutrition in human beings	p. 14	☐	☐	☐	☐
Breakdown of glucose (aerobic and anaerobic)	p. 24	☐	☐	☐	☐
Human respiratory system and exchange of gases	p. 29	☐	☐	☐	☐
Human heart and double circulation	p. 35	☐	☐	☐	☐
Blood vessels, blood and lymph	p. 40	☐	☐	☐	☐
Transportation in plants	p. 44	☐	☐	☐	☐
Excretion in human beings	p. 47	☐	☐	☐	☐
Excretion in plants	p. 51	☐	☐	☐	☐

Ch 6 · Control and Coordination		Read NCERT	Solved Qs	Diagrams	Revised ★
Receptors, neuron and nerve impulse	p. 58	☐	☐	☐	☐
Reflex action and reflex arc	p. 65	☐	☐	☐	☐
Human brain – parts and functions	p. 72	☐	☐	☐	☐
Protecting the brain and spinal cord; CNS and PNS	p. 80	☐	☐	☐	☐
Immediate response to stimulus (touch-me-not)	p. 83	☐	☐	☐	☐
Movement due to growth – tropisms and tendrils	p. 86	☐	☐	☐	☐
Plant hormones	p. 97	☐	☐	☐	☐
Endocrine glands and their hormones	p. 104	☐	☐	☐	☐
Timing and amount of hormones – feedback mechanism	p. 118	☐	☐	☐	☐
Nervous and hormonal coordination compared	p. 120	☐	☐	☐	☐

Ch 7 · How do Organisms Reproduce? – Part A		Read NCERT	Solved Qs	Diagrams	Revised ★
Do organisms create exact copies? (DNA copying and variation)	p. 127	☐	☐	☐	☐
Fission – Amoeba, Leishmania and Plasmodium	p. 128	☐	☐	☐	☐
Fragmentation and regeneration	p. 132	☐	☐	☐	☐
Budding – Hydra and yeast	p. 136	☐	☐	☐	☐
Vegetative propagation	p. 139	☐	☐	☐	☐
Spore formation – Rhizopus (bread mould)	p. 145	☐	☐	☐	☐
Why the sexual mode of reproduction?	p. 148	☐	☐	☐	☐
Sexual reproduction in flowering plants	p. 151	☐	☐	☐	☐

Ch 7 · How do Organisms Reproduce? – Part B (human)		Read NCERT	Solved Qs	Diagrams	Revised ★
Changes at puberty	p. 166	☐	☐	☐	☐
Testes and scrotum	p. 169	☐	☐	☐	☐
Path of sperms and the glands	p. 173	☐	☐	☐	☐
Ovary, oviduct and uterus	p. 177	☐	☐	☐	☐
Fertilisation, implantation and placenta	p. 181	☐	☐	☐	☐
Egg not fertilised – menstruation	p. 188	☐	☐	☐	☐
Germ cells and chromosome number	p. 191	☐	☐	☐	☐
Methods of contraception	p. 193	☐	☐	☐	☐
Sexually transmitted diseases	p. 198	☐	☐	☐	☐
Sex ratio and prenatal sex determination	p. 201	☐	☐	☐	☐

Ch 8 · Heredity		Read NCERT	Solved Qs	Diagrams	Revised ★
Variation during reproduction	p. 208	☐	☐	☐	☐
Inherited traits in human beings	p. 211	☐	☐	☐	☐
Mendel's pea plant, dominant and recessive traits	p. 214	☐	☐	☐	☐
Monohybrid cross – one pair of traits	p. 217	☐	☐	☐	☐
Dihybrid cross – two pairs, independent inheritance	p. 225	☐	☐	☐	☐
Genes, DNA, proteins and chromosome number	p. 229	☐	☐	☐	☐
Sex determination	p. 232	☐	☐	☐	☐

Ch 13 · Our Environment		Read NCERT	Solved Qs	Diagrams	Revised ★
What is an ecosystem — components	p. 243	☐	☐	☐	☐
Decomposers	p. 250	☐	☐	☐	☐
Food chains and trophic levels	p. 253	☐	☐	☐	☐
Flow of energy — 1% and 10% law	p. 262	☐	☐	☐	☐
Food web	p. 275	☐	☐	☐	☐
Biological magnification	p. 280	☐	☐	☐	☐
Ozone layer and its depletion	p. 289	☐	☐	☐	☐
Managing the garbage we produce	p. 298	☐	☐	☐	☐

THE LAST WEEK BEFORE THE EXAM

7 days before	Top Questions of the Book + Must-do 20 of Chapters 5 and 6
6 days before	Must-do 20 of Chapters 7, 8 and 13
5 days before	All diagrams: heart, nephron, alimentary canal, brain, reflex arc, flower, pollen tube, reproductive
4 days before	All questions marked ★★★ and Board ×2 or more
3 days before	Assertion–Reason and case-based questions of every chapter
2 days before	Your own mistakes – the themes with a blank box above
1 day before	Top 10 page of each chapter; sleep well

My Notes

Write your own points, mnemonics and mistakes to avoid

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My Notes

Write your own points, mnemonics and mistakes to avoid

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BIOLOGY

Chapterwise Question Bank · Class 10 · CBSE Science (086) · 2026-27

Every Biology question from past CBSE board papers, sample papers, competency question banks, KVS pre-boards and Sahodaya papers — sorted chapter by chapter, with answers in NCERT words.

- Ch 5 · Life Processes
- Ch 6 · Control and Coordination
- Ch 7 · How do Organisms Reproduce?
- Ch 8 · Heredity
- Ch 13 · Our Environment

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