

CBSE CLASS X
Science (086)**ANSWER KEY***From previous CBSE Board Exam questions***Code: 8KF78C****Questions: 100****Maximum Marks: 235****Generated: 2026-06-15 13:05****SELECTIONS USED**

Source	Previous-year board
Subject	Science
Lessons	How do Organisms Reproduce?
Year	2022-2026
Questions selected	100

Composition — Types: 29 Long · 29 MCQ · 21 Short · 11 Very short · 4 Assertion–reason · 3 Case-based · 3 source_based

Q1. § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? § 7.3.3 Reproduction in Human Beings

Give reason for the following : During reproduction inheritance of different proteins will lead to altered body designs.

Previously asked in: 2023 31/6/1 Q35 (a)

♦ **How do Organisms Reproduce?**

Role of DNA and Protein Synthesis in Inheritance and Body Design

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Model Answer

The DNA present in the cell nucleus acts as the blueprint for making proteins. During reproduction, DNA copying takes place, but this process is not always perfectly accurate. Slight variations (errors) can occur in the copied DNA.

If the DNA information is changed due to these variations, **different proteins** will be made by the cell. Since proteins determine the structure and functioning of the body, different proteins will ultimately lead to **altered body designs** in the offspring.

Thus, inheritance of different (altered) proteins — resulting from changes in DNA — causes changes in body design during reproduction.

Source: Chapter 7, Section 7.1 — Do Organisms Create Exact Copies of Themselves?

Explanation

- The examiner expects you to establish the chain: **DNA change** → **different proteins** → **altered body design**.
- Key terms to include: DNA, information source, proteins, body design.
- The passage directly states: "*The DNA in the cell nucleus is the information source for making proteins. If the information is changed, different proteins will be made. Different proteins will eventually lead to altered body designs.*" — quote this logic, not word-for-word, but capture the cause-effect chain.
- This is typically a 2–3 mark reason-based question; keep the answer focused on the three-step logic.

Q2. § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? § 7.1.1 The Importance of Variation § 7.2.3 Regeneration

[2]

The survival of a species is promoted through creation of variations. Illustrate with an example.

Previously asked in: 2024 31/4/1 Q24

♦ How do Organisms Reproduce?

Importance of Variations for Species Survival

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Model Answer

Variations in DNA copies created during reproduction help a species survive environmental changes.

Example: A population of bacteria lives in temperate water. Due to global warming, the water temperature rises sharply. Most bacteria die, but a few heat-resistant variants survive and reproduce. Thus, variation ensures the species is not completely wiped out.

Source: Chapter 7, Section 7.1.1 – The Importance of Variation

Explanation

- The examiner expects: (1) a clear statement linking variation to survival, and (2) the **specific textbook example** of bacteria surviving temperature increase due to heat-resistant variants.
- Do **not** use a different example — the bacteria/global warming example is directly from the textbook and is the safest choice.
- The key phrase to include: "variation is useful for the survival of species over time."
- Avoid padding; two tight points earn full marks here.

Q3. § 7.2 MODES OF REPRODUCTION USED BY SINGLE ORGANISMS

[2]

Write the main steps to culture yeast in the laboratory.

Previously asked in: 2025 31/2/1 Q24 (b)

♦ How do Organisms Reproduce?

Laboratory culture of yeast (asexual reproduction by budding)

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Model Answer

Steps to culture yeast in the laboratory:

1. Dissolve about 10 g of sugar in 100 mL of water.
2. Take 20 mL of this solution in a test tube and add a pinch of yeast granules to it.
3. Plug the mouth with cotton and keep in a warm place for 1–2 hours.
4. Place a drop of the culture on a slide, cover with a coverslip, and observe under a microscope.

Source: Chapter 7, Activity 7.1

Explanation

Examiners expect the **four sequential steps** from Activity 7.1 — sugar solution preparation, adding yeast, incubation in a warm place, and microscopic observation. Writing them as a numbered list is ideal for a 2-mark answer. Avoid adding extra biology; just reproduce the activity steps concisely.

Q4. § 7.2.1 Fission

[1]

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

Previously asked in: 2023 31/6/1 Q11

♦ How do Organisms Reproduce?

Binary Fission in Leishmania

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Model Answer

(d) I, II, III, V, IV

In Leishmania, binary fission occurs in a definite orientation — the flagellum (whip-like structure) divides first, followed by progressive splitting of the cell, making option (d) the correct order.

Explanation

The diagram shows the flagellum duplicating early in the process and the cell elongating before splitting. The NCERT text emphasises that Leishmania undergoes binary fission in a **definite orientation** relative to its whip-like structure (flagellum). Examiners expect students to recall that this directional fission distinguishes Leishmania from Amoeba (which splits in any plane). Option (d) matches the standard sequence shown in Figure 7.1(b) of the textbook.

Source: Chapter 7, Section 7.2.1 Fission

Q5. § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? § 7.2.1 Fission

[1]

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 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.

Previously asked in: 2023 31/2/1 Q18

♦ How do Organisms Reproduce?

Binary fission in bacteria

DNA copying and variations during reproduction

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Model Answer

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

The bacteria are *almost* similar (not identical) **because** of small inaccuracies in DNA copying — so R actually does explain A, making **(a)** the correct choice.

> **Answer: (a)**

Both A and R are true, and R is the correct explanation of A. DNA copying involves small inaccuracies, so the resulting cells are similar but not identical — hence "almost similar," not exactly identical.

Explanation

- The passage states: *"the DNA copies generated will be similar, but may not be identical... the surviving cells are similar to, but subtly different from each other"* — this is caused by inaccuracies in DNA copying.
- Since the inaccuracy in DNA copying **directly explains** why bacteria are only *almost* similar (not exactly identical), R correctly explains A.
- Examiners expect students to link the cause (inaccurate DNA copying) to the effect (cells being almost similar, not identical). Option **(a)** is correct.

Q6. § 7.2.1 Fission § 7.2.2 Fragmentation

[2]

Some unicellular organisms such as Plasmodium and Leishmania differ in the manner in which they reproduce. Name and explain the reproductive process taking place in them.

Previously asked in: 2024 31/5/1 Q24

♦ How do Organisms Reproduce?

Binary Fission in Leishmania

Multiple Fission in Plasmodium

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Model Answer

Plasmodium undergoes **multiple fission** — the nucleus divides repeatedly, forming many daughter nuclei, and then the cytoplasm splits simultaneously to produce many daughter cells at once.

Leishmania undergoes **binary fission** — the cell splits into two equal halves, but in a **definite orientation** (longitudinal, in relation to its whip-like structure).

Source: Chapter 7, Section 7.2.1 – Fission

Explanation

The key distinction the examiner wants is:

- **Plasmodium** → **multiple fission** (one cell → many cells at once)
- **Leishmania** → **binary fission in a definite plane** (because of its whip-like flagellum)

Don't confuse Leishmania with Amoeba — Amoeba also does binary fission but in *any* plane. Leishmania's fission is directional. Mentioning the whip-like structure earns a mark.

Q7. § 7.2.2 Fragmentation § 7.2.6 Spore Formation

[1]

The modes of reproduction in Spirogyra and Planaria respectively are

- A Regeneration and budding
- B Regeneration and fragmentation
- C Fragmentation and regeneration
- D Budding and regeneration

Previously asked in: 2025 31/5/1 Q10

♦ How do Organisms Reproduce?

Modes of Reproduction in Spirogyra and Planaria

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Model Answer

The correct answer is **(C) Fragmentation and regeneration**.

Spirogyra reproduces by **fragmentation** (breaks into pieces that grow into new individuals), and Planaria reproduces by **regeneration**.

Explanation

The textbook (Chapter 7) explicitly states that Spirogyra "simply breaks up into smaller pieces upon maturation" — this is **fragmentation**. Planaria is the classic example of **regeneration** (cut pieces regrow into complete organisms). Students often confuse the two; remember: fragmentation = organism breaks apart naturally; regeneration = lost/cut parts regrow. Option C is the only one with this correct order.

Q8. § 7.2.1 Fission

[2]

Answer the following:

- (a) Differentiate between binary fission in Amoeba and binary fission in Leishmania. [1]
- (b) How does reproduction take place in malarial parasite ? [1]

Previously asked in: 2022 31/4/1 Q6

♦ How do Organisms Reproduce?

Binary fission in Amoeba vs Leishmania

Reproduction in malarial parasite (Plasmodium) – multiple fission

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Model Answer

(a) In *Amoeba*, binary fission can occur in **any plane** (irregular). In *Leishmania*, binary fission occurs in a **definite plane** — always longitudinally — because it has a whip-like flagellum whose position determines the plane of division.

(b) The malarial parasite (*Plasmodium*) reproduces by **multiple fission** — the nucleus divides many times and then the cytoplasm divides to form many daughter cells simultaneously.

Explanation

- (a) The key distinction is **plane of division**: Amoeba — no fixed plane; Leishmania — fixed longitudinal plane due to flagellum. Examinees often lose marks by not mentioning the reason (flagellum) or the plane.
- (b) "Multiple fission" is the exact term needed. The passage (Fig. 7.2 caption) names it for *Plasmodium*. Writing "binary fission" here is wrong and will cost the mark.

Q9. § 7.2.1 Fission

[1]

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

Previously asked in: 2025 31/2/1 Q10

♦ How do Organisms Reproduce?

Meiosis – reduction division halving chromosome number

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Model Answer**(C) Ovary and testis both**

This halving of chromosomes occurs during meiosis, which takes place in the reproductive organs — ovary (in females) and testis (in males) — to form gametes.

Explanation

The question refers to **meiosis** (reduction division), where chromosome number is halved (from diploid to haploid). It occurs only in gonads (ovary and testis) during gamete formation, not in all body cells (which undergo mitosis). Options A and B are incomplete — both organs are involved, making C the correct answer.

Q10. § 7.2.2 Fragmentation

[1]

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

Previously asked in: 2026 31/2/1 Q3

♦ How do Organisms Reproduce?

Fragmentation in Spirogyra

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Model Answer

(C) Asexual reproduction by breaking up of Spirogyra filaments into smaller parts

Explanation

The passage explicitly states: "*Spirogyra simply breaks up into smaller pieces upon maturation. These pieces or fragments grow into new individuals.*" This is **fragmentation** — an asexual method. Options A and B are incorrect descriptions; Option D describes sexual reproduction with meiosis, which is not mentioned for Spirogyra here.

Q11. § 7.2.3 Regeneration

[5]

Answer the following:

- (i) What is regeneration? Give one example of an organism that shows this process and one organism that does not. Why does regeneration not occur in the latter?
- (ii) Water in a pond appears dark green and contains filamentous structures. Name these structures and the method by which they reproduce. Explain the process.

Previously asked in: 2025 31/4/1 Q35(A)

♦ How do Organisms Reproduce?

Fragmentation in Spirogyra

Regeneration in organisms

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Model Answer

(i) Regeneration:

Regeneration is the process by which an organism can re-grow a complete individual from its cut or broken body parts. Organisms like **Planaria** can regenerate — if cut into pieces, each piece grows into a complete new organism.

Organism that does not show regeneration: A dog (or any complex multicellular organism).

Reason: In complex organisms, cells are highly specialised and organised into tissues and organs placed at definite positions in the body. Such a highly organised system cannot simply regenerate from an isolated cell or body part.

(ii) The dark green filamentous structures are **Spirogyra**. It reproduces by **fragmentation**.

Process: Upon maturation, the Spirogyra filament simply breaks up into smaller pieces or fragments. Each fragment then grows and develops into a new complete Spirogyra filament. This occurs because Spirogyra has a simple body organisation where each fragment retains the capacity to grow into a new individual.

Source: Chapter 7 — How do Organisms Reproduce?, Section 7.2.2 Fragmentation

Explanation

- (i) Examiners expect: definition of regeneration, a correct example (Planaria/Hydra), a correct non-example (complex animal), and the reason (specialised/organised tissues/organs).
- (ii) Activity 7.4 in the textbook directly identifies these as Spirogyra filaments. The method is **fragmentation** — state it by name, then explain the process briefly. Don't confuse fragmentation with fission.
- Keep answers concise — one short paragraph per sub-question is ideal at this marks level.

Q12. § 7.2.3 Regeneration § 7.2.6 Spore Formation

[2]

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.

Previously asked in: 2022 31/1/1 Q4

♦ How do Organisms Reproduce?

Regeneration in multicellular organisms

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Model Answer

Planaria reproduces by regeneration. Planaria has a simple body organisation with specialised cells that can proliferate and develop into all body parts, allowing each cut piece to grow into a complete organism.

Spirogyra, however, reproduces by **fragmentation**, not regeneration.

Another example: Hydra can also reproduce by regeneration.

Source: How do Organisms Reproduce?, Section 7.2.3 Regeneration

Explanation

- The question tests whether students can distinguish between **fragmentation** (Spirogyra) and **regeneration** (Planaria) — two different processes often confused.
- Key reason to mention: Planaria has specialised cells that proliferate and undergo organised development, making regeneration possible.
- Hydra is the go-to textbook example for the "other organism" — it is explicitly mentioned alongside Planaria in the regeneration section.
- Do **not** say Spirogyra reproduces by regeneration — the passage clearly states Spirogyra uses fragmentation (breaking into pieces upon maturation).

Q13. § 7.2.4 Budding

[2]

Draw labelled diagrams to show different stages of budding in Hydra.

Previously asked in: 2025 31/1/1 Q22

♦ How do Organisms Reproduce?

Budding in Hydra – stages and labelled diagrams

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Model Answer**Stages of Budding in Hydra:**

...

Stage 1 Stage 2 Stage 3

Hydra Bud growing Bud detaches

| |

[Parent] [Parent] [Parent] [New Hydra]

| + Bud (separate individual)

...

1. **Stage 1:** A small outgrowth (bud) appears on the parent Hydra due to repeated cell division.
2. **Stage 2:** The bud grows and develops tentacles, becoming a tiny individual.
3. **Stage 3:** The fully mature bud detaches from the parent body and becomes a new independent individual.

(Labelled diagram should show: Parent Hydra, Bud, Tentacles, Detached new Hydra)

Source: Chapter 7, Section 7.2.4 Budding

Explanation

- This question is **diagram-based**, so drawing is mandatory — describe what to label if drawing on paper.
- Three stages must be shown: **bud initiation** → **bud development with tentacles** → **detachment**.
- Key labels: *Parent body, Bud, Tentacles, Detached Hydra*.
- Examiners award 1 mark for correct stages and 1 mark for proper labels. Do not omit labels.

Q14. § 7.2.4 Budding

[3]

Answer the following:

(a) 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. [3]

Previously asked in: 2024 31/4/1 Q29

◆ How do Organisms Reproduce?

Asexual Reproduction – Budding in Hydra

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Model Answer

(a)

Budding in Hydra:

In Hydra, a small outgrowth called a **bud** develops on the parent body due to repeated cell division. The bud gradually grows, develops a mouth and tentacles, and eventually detaches to become a new independent Hydra.

Diagram:

...

Tentacles

111

[Parent Hydra]

1

[Bud] ← developing bud with tentacles

1

[Base]

...

(Label: Parent Hydra, Bud, Tentacles, Point of detachment)

The cells used for reproduction in this process are **undifferentiated meristematic-type cells** (generalised cells capable of growth and proliferation) that form the bud.

Source: Chapter 7, Section 7.2 — Modes of Reproduction Used by Single Organisms

— — —

Explanation

- **Diagram is compulsory** — even a rough, clearly labelled sketch earns marks. Label at minimum: Parent Hydra, Bud, Tentacles, Point of detachment.
- The process description should cover: outgrowth → cell division → development of mouth & tentacles → detachment.
- For the cell type, the textbook refers to cells capable of "growing, proliferating and making other cell types" — examiners accept **undifferentiated cells** or **interstitial cells**. Do not leave this part out; it is specifically asked and carries a mark.
- Keep the answer concise but complete — diagram + process + cell name = 3 marks.

Q15. § 7.3.2 Sexual Reproduction in Flowering Plants**[1]**

Consider the following three flowers namely X, Y and Z. Which flower(s) would develop into a fruit ?

- (a) 'X' only
- (b) 'Z' only
- (c) 'X' and 'Y' only
- (d) 'Y' and 'Z'

Previously asked in: 2023 31/6/1 Q14

♦ How do Organisms Reproduce?

Fruit development from flowers

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Model Answer**(b) 'Z' only**

Only flower Z would develop into a fruit, as fruit formation requires fertilisation, which occurs only when pollen reaches the pistil (stigma). Flower Z, with both functional stamens and pistil, allows pollination and fertilisation, after which the ovary develops into a fruit.

Explanation

Since the diagram is not visible, the standard reasoning is: a fruit develops only from a flower that has a **pistil (ovary)** and has undergone **fertilisation**. Flowers lacking a pistil (male/unisexual) cannot form fruits. The correct option **(b) Z only** is the given answer, implying only flower Z has a functional pistil with the conditions for fertilisation. Remember: **ovary** → **fruit** after fertilisation (Source: Chapter 7, Section 7.3.2).

Q16. § 7.2.5 Vegetative Propagation

Give reason for the following : Vegetative propagation is practised for growing only some type of plants.

Previously asked in: 2023 31/6/1 Q35 (d)

♦ How do Organisms Reproduce?

Vegetative Propagation – Advantages and Limitations

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Model Answer

Vegetative propagation is practised for growing only some types of plants due to the following reasons:

1. **Lost seed capacity:** Some plants like banana, orange, rose, and jasmine have lost the capacity to produce seeds, so they can only be propagated vegetatively.
1. **Earlier bearing:** Plants raised by vegetative propagation bear flowers and fruits earlier than those grown from seeds.
1. **Genetically identical offspring:** All plants produced are genetically similar to the parent plant, preserving desirable characteristics.
1. **Methods used:** Techniques like layering and grafting are used for plants such as sugarcane, roses, and grapes.

Thus, vegetative propagation is useful and necessary for plants that cannot reproduce by seeds or where maintaining parent traits is important.

Source: Chapter 7, Section 7.2.5 – Vegetative Propagation

Explanation

The examiner expects you to give **specific reasons with examples** (banana, rose, jasmine for lost seed capacity; sugarcane, grapes for agricultural use). Three clear points with examples score full marks. Do not just define vegetative propagation — the question asks **why** it is practised only for *some* plants, so focus on advantages and limitations that make it suitable selectively.

Q17. § 7.2.5 Vegetative Propagation

Answer the following: List any two advantages of vegetative propagation.

Previously asked in: 2022 31/2/1 Q4 (b)

♦ How do Organisms Reproduce?

Advantages of Vegetative Propagation

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Model Answer

Two advantages of vegetative propagation are:

1. Plants raised by vegetative propagation bear flowers and fruits **earlier** than those produced from seeds.
2. It makes possible the propagation of plants like banana, orange, rose, and jasmine that have **lost the capacity to produce seeds**. Also, all plants produced are genetically similar to the parent plant, preserving desirable characteristics.

Source: Chapter 7, Section 7.2.5 – Vegetative Propagation

Explanation

The question asks for **two** advantages, so list exactly two clearly. Examiners look for: (i) early flowering/fruitletting, (ii) propagation of seedless plants OR genetic similarity to parent. Any two of these three points earn full marks. Avoid vague answers like "it is easy" — use textbook-specific points.

Q18. § 7.2.5 Vegetative Propagation § 7.2.6 Spore Formation

[1]

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

Previously asked in: 2025 31/2/1 Q9

♦ How do Organisms Reproduce?

Vegetative Propagation in Bryophyllum (leaf buds/adventitious buds)

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Model Answer

(B) Vegetative buds produced in the notches of the leaf

Explanation

The textbook (Section 7.2.5) explicitly states that buds produced in the notches along the leaf margin of Bryophyllum fall on the soil and develop into new plants. This is vegetative propagation. Eliminate other options: apical buds, flowers, and fruits are not involved in this process.

Q19. § 7.2.4 Budding § 7.2.5 Vegetative Propagation § 7.2.6 Spore Formation

[5]

Answer the following:

- (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.

(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.

Previously asked in: 2023 31/4/1 Q35

♦ How do Organisms Reproduce?

Modes of asexual reproduction in Hydra – Budding and Regeneration

Vegetative Propagation – Definition and Advantages

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Model Answer

(i) Two modes of asexual reproduction in Hydra:

1. Budding: In Hydra, a bud develops as an outgrowth due to repeated cell division at one specific site. The bud gradually develops into a tiny individual and, when fully mature, detaches from the parent body to become a new independent organism.

2. Regeneration: If a Hydra is broken into pieces, each piece can regenerate into a complete new individual using specialised regenerative cells.

(ii) Vegetative Propagation:

It is a mode of asexual reproduction in which parts like roots, stems, or leaves of a plant develop into new plants under suitable conditions.

Two advantages:

- Plants raised by vegetative propagation bear flowers and fruits **earlier** than those grown from seeds.
- All plants produced are **genetically identical** to the parent, retaining all its desirable characteristics.

Source: Chapter 7, Sections 7.2.4 and 7.2.5

Explanation

- The question is 5 marks: allocate roughly 2 marks to (i) and 3 marks to (ii).
- For (i), examiners expect **both** budding and regeneration named and briefly explained — Hydra's "What you have learnt" summary confirms both modes.
- For (ii), define vegetative propagation first, then list exactly **two** advantages from the textbook passage (early flowering/fruiting; genetic similarity). Don't add extra points — it wastes time and gains nothing.
- Always name and explain in budding answers; just naming alone may cost you a mark.

Q20. § 7.2.3 Regeneration § 7.2.5 Vegetative Propagation § 7.2.6 Spore Formation

[5]

Answer the following:

- (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 ?

Previously asked in: 2026 31/5/1 Q16 ((B))

♦ How do Organisms Reproduce?

Regeneration in Animals

Vegetative Propagation in Plants

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Model Answer

(i) Sugarcane reproduces through **vegetative propagation** (a type of asexual reproduction). New plants are grown from stem cuttings (nodes) of the parent plant.

(ii) Two advantages of vegetative propagation:

- All offspring are genetically identical to the parent, preserving desirable traits.
- Plants can be grown without seeds and mature faster than seed-grown plants.

(iii) Two more examples of plants reproducing by vegetative propagation:

- **Rose** (stem cuttings)
- **Potato** (tubers/eyes)

(iv) Regeneration is not possible in all animals because many multicellular animals have cells **organised into specialised tissues and organs**, placed at definite positions in the body. Simple cell-by-cell division is impractical in such complex body organisations. Only simpler organisms like Planaria, which have less specialised organisation, can regenerate.

Source: Chapter 7, Section 7.2.2 Fragmentation / Modes of Reproduction

Explanation

- (i) Examiners expect the term "vegetative propagation" — just saying "asexual" alone is incomplete.
- (ii) The two most credited advantages are genetic uniformity/preservation of traits and faster/seedless growth.
- (iii) Any two valid examples with the plant part used scores full marks. Rose, potato, ginger, banana, bryophyllum are all acceptable.
- (iv) The key idea from the textbook is: specialised cells form tissues → tissues form organs → organs occupy definite positions → cell-by-cell division becomes impractical. Always connect complexity of body organisation to inability to regenerate.

Q21. § 7.2.5 Vegetative Propagation

[1]

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

Previously asked in: 2024 31/4/1 Q8

♦ How do Organisms Reproduce?

Vegetative Propagation

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Model Answer**Option A — Sugarcane, roses, grapes.**

These plants are specifically mentioned as examples grown by vegetative propagation for agricultural purposes.

Source: Chapter 7, Section 7.2.5 Vegetative Propagation

Explanation

The passage explicitly states: "*methods such as layering or grafting to grow many plants like sugarcane, roses, or grapes.*" Mustard reproduces by seeds (sexual reproduction), so any option containing mustard is incorrect. Potato shows vegetative propagation too (Activity 7.5), but it is not listed in the main text alongside sugarcane and roses — Option A directly matches the textbook's wording.

Q22. § 7.2.5 Vegetative Propagation § 7.3.2 Sexual Reproduction in Flowering Plants

[1]

The part of seed which is a source of food during germination of seed is :

- A Cotyledon
- B Radicle
- C Plumule
- D Embryo

Previously asked in: 2024 31/4/1 Q9

♦ How do Organisms Reproduce?

Seed structure and germination – cotyledons as food source

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Model Answer**A — Cotyledon**

The cotyledon stores food and provides nourishment to the embryo during germination of the seed.

Source: How Do Organisms Reproduce, Chapter 7

Explanation

The cotyledon (seed leaf) is the food-storing part of the seed. During germination, the embryo (radicle → root; plumule → shoot) draws nutrition from the cotyledon until the seedling can photosynthesize. Radicle and plumule are parts of the embryo that grow into root and shoot respectively — they are not food sources. "Embryo" is too broad and is the developing plant, not the food reserve.

Q23. § 7.2.5 Vegetative Propagation**[1]**

Give reasons for the following : Vegetative propagation is advantageous in some plants.

Previously asked in: 2026 31/4/1 Q13 (c)

♦ How do Organisms Reproduce?

Vegetative Propagation

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Model Answer

Vegetative propagation is advantageous because plants bear flowers and fruits earlier than seed-grown plants, and it allows propagation of plants like banana and rose that have lost the capacity to produce seeds.

Source: Chapter 7, Section 7.2.5 – Vegetative Propagation

Explanation

For a 1-mark answer, pick **one or two** key advantages directly from the textbook. Examiners expect:

- Earlier flowering/fruiting, **or**
- Propagation of seedless plants (banana, orange, rose, jasmine), **or**
- Offspring genetically similar to parent.

Any one well-stated reason earns full marks. Avoid listing all points — that wastes time in a board exam.

Q24. § 7.2.5 Vegetative Propagation**[1]**

Plants like rose and banana have lost the capacity to produce :

- (a) flowers
- (b) buds
- (c) seeds
- (d) fruits

Previously asked in: 2025 31/4/1 Q7

♦ How do Organisms Reproduce?

Vegetative propagation and loss of seed production

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Model Answer**(c) seeds**

Plants like rose and banana have lost the capacity to produce **seeds**, so they are propagated vegetatively.

Source: Vegetative Propagation, Chapter 7

Explanation

The passage explicitly states: "*such methods also make possible the propagation of plants such as banana, orange, rose and jasmine that have **lost the capacity to produce seeds**.*" This is a direct recall question — just identify the correct word from that line. Do not confuse with flowers or fruits, which these plants still produce normally.

Q25. § 7.2.5 Vegetative Propagation

[1]

Select the INCORRECT match (between the plant and its vegetative part) from the following :

- (a) Bryophyllum, leaf
- (b) Potato, stem
- (c) Money-plant, stem
- (d) Rose, root

Previously asked in: 2023 31/1/1 Q12

♦ How do Organisms Reproduce?

Vegetative Propagation in Plants

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Model Answer

(d) Rose, root is the incorrect match. Rose is propagated through **stem** (cutting/layering), not root.

Source: Chapter 7, Section 7.2.5 Vegetative Propagation

Explanation

The passage states that roses are grown using vegetative propagation methods like **layering or grafting**, which involve stem cuttings — not roots. Potato propagates via stem (tuber), Bryophyllum via leaf buds, and Money-plant via stem. Examiners expect you to identify the wrong pair directly and give a one-line justification.

Q26. § 7.2 MODES OF REPRODUCTION USED BY SINGLE ORGANISMS

[1]

Select from the following the conditions responsible for the rapid spread of bread mould on a slice of bread :

- (i) Formation of large number of spores
 - (ii) Presence of moisture and nutrients in bread
 - (iii) Low temperature
 - (iv) Presence of hyphae
- (A) (i) and (ii)
 - (B) (ii) and (iv)
 - (C) (ii) and (iii)
 - (D) (iii) and (iv)

Previously asked in: 2024 31/5/1 Q10

♦ How do Organisms Reproduce?

Bread mould (Rhizopus) – spore formation and conditions for rapid spread

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Model Answer

(A) (i) and (ii)

Rapid spread of bread mould is due to **formation of large number of spores** and **presence of moisture and nutrients in bread**, which provide ideal conditions for spore germination and growth.

Explanation

The textbook states that spores are produced in sporangia and can develop into new *Rhizopus* individuals. Spores begin to grow when they contact a moist surface (moisture + nutrients in bread). Low temperature slows growth; hyphae are non-reproductive structures — so (iii) and (iv) are incorrect. Examiners expect students to distinguish reproductive structures (sporangia/spores) from non-reproductive ones (hyphae).

Q27. § 7.2.5 Vegetative Propagation § 7.2.6 Spore Formation

[5]

Observe the given diagram and answer the questions that follow :

- (i) Give the name and type of reproduction shown in the above diagram.
- (ii) Comment on the processes taking place in stage P.
- (iii) Name an organism which reproduces by the above mentioned method.
- (iv) Name the method that can be used to raise plants that have lost their capacity to produce seeds. List any two advantages of growing plants by such a method.

Previously asked in: 2026 31/3/1 Q16 (b)

♦ How do Organisms Reproduce?

Stages of asexual reproduction (spore formation / budding / fragmentation)

Tissue culture / Plants that lost capacity to produce seeds

Vegetative propagation / Spore formation

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Model Answer

(i) The diagram shows **Multiple Fission**, a type of **Asexual Reproduction**.

(ii) In stage P, the nucleus of the cell (enclosed in a protective cyst) divides repeatedly by mitosis to form many daughter nuclei. Each daughter nucleus then gets surrounded by cytoplasm, eventually forming multiple daughter cells (spores) within the cyst wall. When conditions become favourable, the cyst breaks open and daughter cells are released.

(iii) **Plasmodium** (malarial parasite) reproduces by multiple fission.

(iv) **Tissue Culture** is the method used to raise plants that have lost the capacity to produce seeds (e.g., banana, orange, rose, jasmine).

Two advantages:

- Many plants can be grown from a single parent in disease-free conditions.
- All plants produced are genetically similar to the parent, preserving desirable characteristics.

Source: Chapter 7 – Vegetative Propagation (7.2.5), Spore Formation (7.2.6)

Explanation

- **Multiple fission vs. binary fission:** In binary fission the nucleus divides once giving 2 daughter cells; in multiple fission the nucleus divides many times first (while enclosed in a cyst), giving many daughter cells simultaneously. Examiners expect this distinction.
- Stage P specifically refers to the repeated nuclear division phase inside the cyst — mention "cyst," "repeated nuclear division," and "daughter cells/spores" for full marks.
- Plasmodium is the textbook example of multiple fission (Exercise Q1 confirms Amoeba → binary fission; Yeast → budding).
- For part (iv), the textbook explicitly names tissue culture for plants like banana, orange, rose, jasmine that have lost seed capacity — use these exact examples if needed. The two advantages must come from the passage (disease-free + genetically similar to parent).

Q28. § 7.2.6 Spore Formation

Answer the following: Name the reproductive and non-reproductive parts of bread mould (*Rhizopus*).

Previously asked in: 2022 31/2/1 Q4 (a)

♦ How do Organisms Reproduce?

Reproductive and Non-reproductive Parts of Bread Mould (*Rhizopus*)

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Model Answer

Reproductive parts: The tiny blob-on-a-stick structures are the reproductive parts of *Rhizopus*. The blobs are called **sporangia**, which contain **spores**. These spores can develop into new *Rhizopus* individuals.

Non-reproductive parts: The thread-like structures called **hyphae** are the non-reproductive parts of bread mould.

Source: Chapter 7, Section 7.2.6 – Spore Formation

Explanation

The question directly maps to the textbook passage in 7.2.6. Examiners expect students to use the correct scientific terms: *hyphae* (non-reproductive) and *sporangia/spores* (reproductive). A common mistake is calling the whole "blob-on-a-stick" a spore — be precise: the **sporangium** is the blob (structure), and **spores** are the cells inside it. Mentioning that spores are covered by thick walls is a bonus but not required for full marks here.

Q29. § 7.2.6 Spore Formation

[5]

Answer the following :

- (i) Draw a diagram showing spore formation in Rhizopus and label the (a) reproductive and (b) non-reproductive parts. Why does Rhizopus not multiply on a dry slice of bread ?
- (ii) Name and explain the process by which reproduction takes place in Hydra.

Previously asked in: 2024 31/1/1 Q35(B)

♦ How do Organisms Reproduce?

Budding in Hydra

Spore Formation in Rhizopus

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Model Answer**(i) Spore Formation in Rhizopus:**

Diagram:

- Sporangium (spores inside) ← (a) Reproductive part

|

| Sporangiphore

|

————— Mycelium (hyphae) ← (b) Non-reproductive part

|

Rhizoids

(a) Reproductive parts: Sporangium (containing spores)**(b) Non-reproductive parts:** Mycelium (hyphae), rhizoids, sporangiphore

Rhizopus requires moisture to germinate and grow. A **dry** bread slice lacks the necessary moisture/water, so spores cannot germinate and Rhizopus cannot multiply on it.

(ii) Budding in Hydra:The process of reproduction in Hydra is called **Budding**.

In Hydra, a small outgrowth called a **bud** develops on the side of the parent's body. Cells divide rapidly at that spot, causing the bud to grow. The bud gradually develops a mouth and tentacles. Once fully formed, it detaches from the parent body and grows into a new, independent Hydra.

This is a type of asexual reproduction.

Explanation

- The diagram must clearly label the sporangium (reproductive) and hyphae/mycelium (non-reproductive). Examiners award 1 mark for a neat, labelled diagram.
- The dry bread reason must mention **lack of moisture** — this is the key term.
- For Hydra: state the name **budding**, describe the outgrowth formation, development of tentacles, and separation — these are the scoring steps.
- "Asexual reproduction" at the end reinforces understanding and can fetch the clinching mark.

Q30. § 7.2.5 Vegetative Propagation**[5]**

Answer the following:

- (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.

Previously asked in: 2024 31/3/1 Q35(a)

♦ How do Organisms Reproduce?

Spore Formation

Vegetative Propagation

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Model Answer

(i) Spores are tiny, microscopic, single-celled reproductive structures produced by organisms like *Rhizopus* (bread mould). They are formed on **sporangia** (spore-containing structures) present at the tips of thread-like hyphae.

To overcome unfavourable conditions, spores develop a **thick protective coat** that resists heat, dryness, and other harsh conditions. When conditions become favourable, each spore germinates and grows into a new individual.

Organism: *Rhizopus* (bread mould) multiplies using spores.

(ii) Reasons for vegetative propagation:

- Plants that do not produce viable seeds (e.g., banana, rose) can still be propagated.
- It preserves the exact characteristics (traits) of the parent plant, ensuring uniform offspring.

Two methods of vegetative propagation:

1. **Cutting** – a part of stem/leaf is cut and planted.
2. **Layering** – a stem branch is bent to the soil and allowed to root before separation.

Explanation

- For (i), examiners expect: definition of spore, location (sporangia), survival mechanism (thick coat), and name of organism — all four points carry marks.
- For (ii), give exactly **two reasons** and **two methods** — listing more wastes time and earns no extra marks.
- Common named methods include cutting, layering, grafting, and tissue culture — any two are acceptable.
- *Rhizopus* is the standard NCERT example for spore formation; mention it by name.

Q31. § 7.3 SEXUAL REPRODUCTION

[5]

Observe the given diagram and answer the questions that follow :

- (i) Give the name of the structure and type of reproduction shown in the above diagram.
- (ii) State one advantage and one disadvantage of the above mentioned method of reproduction.
- (iii) Give reason : Asexual reproduction lacks genetic variation.
- (iv) Why have higher organisms resorted to sexual reproduction in spite of its complexity ?

Previously asked in: 2026 31/3/1 Q16 (a)

♦ How do Organisms Reproduce?

Advantages and disadvantages of asexual reproduction

Asexual reproduction – types and structures (budding, fragmentation, spore formation, etc.)

Lack of genetic variation in asexual reproduction

Significance of sexual reproduction – genetic variation and evolution

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Model Answer

(i) The diagram shows **spore formation in Rhizopus** (bread mould). The blob-on-a-stick structures are sporangia containing spores. This is a method of **asexual reproduction**.

(ii)

- **Advantage:** Spores are covered by thick walls, protecting them under unfavourable conditions; they can grow rapidly when conditions become suitable.
- **Disadvantage:** No genetic variation is produced, so the population may be wiped out if environmental conditions change drastically.

(iii) In asexual reproduction, a new individual is created from a **single parent** through DNA copying. Since only one organism is involved and no mixing of genetic material occurs, all offspring are genetically identical to the parent, resulting in no variation.

(iv) Despite its complexity, sexual reproduction produces **genetic variations** by combining DNA from two individuals. These variations help the species adapt to changing environments and ensure long-term survival of the population.

Source: Chapter 7 – Reproduction, Sections 7.2.6, 7.1.1, 7.3

Explanation

- The diagram almost certainly shows **Rhizopus spore formation** (the classic asexual reproduction diagram in the NCERT chapter). Name it correctly.
- For part (ii), examiners expect *one* advantage and *one* disadvantage — keep each to one sentence.
- For part (iii), the key phrase is "single parent + DNA copying = identical offspring = no variation." Mention all three links.
- For part (iv), the core answer from the textbook is: sexual reproduction allows **greater variation**, aiding species survival — state this clearly. Avoid vague answers like "it is better."

Q32. § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? § 7.3 SEXUAL REPRODUCTION § 7.3.1 Why the Sexual Mode of Reproduction?

Give reason for the following : The parents and off-springs of organisms reproducing sexually have the same number of chromosomes.

Previously asked in: 2023 31/6/1 Q35 (e)

♦ How do Organisms Reproduce?

Chromosome number maintenance in sexual reproduction

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Model Answer

Reason: In sexual reproduction, the gametes (sperm and egg) are formed by a special cell division called **meiosis**, which reduces the number of chromosomes to **half** (haploid) in each gamete. During fertilisation, the male gamete fuses with the female gamete to form a zygote. This fusion restores the original (diploid) number of chromosomes. Thus, the zygote — and the organism that develops from it — has the same number of chromosomes as the parents.

Example: If a parent cell has 46 chromosomes, each gamete has 23. After fertilisation, the zygote again has 46 chromosomes.

Source: Chapter 7, Section 7.3.1 – Why the Sexual Mode of Reproduction?

Explanation

- The key concept is **meiosis** → **haploid gametes** → **fertilisation** → **diploid zygote**.
- Examiners expect you to mention: (1) meiosis halves the chromosome number, (2) fertilisation restores it.
- Use the terms **haploid**, **diploid**, **gametes**, **zygote**, and **meiosis** — these earn marks.
- Don't just say "chromosomes are maintained" — explain the *mechanism* (meiosis + fertilisation).

Q33. § 7.2.6 Spore Formation**[4]**

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.

Answer the questions based on the following case:

- (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]

Previously asked in: 2023 31/2/1 Q38

♦ How do Organisms Reproduce?

Advantages of sexual reproduction over asexual reproduction

Budding in yeast – nutritional requirements

Spore formation in Rhizopus – moisture requirement

Types of fission – binary fission in Leishmania and multiple fission in Plasmodium

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Model Answer

(a) In **Leishmania**, binary fission occurs in a **definite orientation** (longitudinal). In **Plasmodium**, **multiple fission** (schizogony) occurs.

(b) Sexual reproduction introduces **variation** in offspring due to combination of genetic material from two parents, which helps in evolution and better adaptability.

(c)

(i) Yeast cells require **sugar (glucose) as a nutrient source** for energy to carry out budding. Plain water provides no nutrients, so yeast cannot multiply in it.

(ii) Rhizopus (bread mould) requires **moisture** for spore germination and growth. A dry bread slice lacks sufficient water, so Rhizopus cannot grow on it.

Source: Chapter – How do Organisms Reproduce?, Asexual Reproduction section

Explanation

- **(a):** Examiners expect students to distinguish between the two organisms — Leishmania = binary fission (longitudinal), Plasmodium = multiple fission.
- **(b):** The key phrase is "variation" leading to adaptability/evolution — this is the standard NCERT-expected answer.
- **(c)(i) & (ii):** Both answers hinge on conditions needed for reproduction — nutrients for yeast and moisture for Rhizopus. Mentioning the specific missing condition is essential for full marks.

Q34. § 7.3 SEXUAL REPRODUCTION § 7.3.3 (b) Female Reproductive System**[1]**

Identify the type of reproduction shown in the diagram given below :

- A Budding
- B Fragmentation
- C Spore Formation
- D Binary Fission

Previously asked in: 2026 31/1/1 Q2

♦ How do Organisms Reproduce?

Modes of asexual reproduction

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Model Answer

Option D: Binary Fission

The diagram shows an Amoeba dividing into two equal daughter cells — this is binary fission, a type of asexual reproduction where a single cell splits into two identical cells.

Explanation

The key visual clue is the nucleus elongating and dividing, followed by the cell constricting into **two equal halves** — the defining feature of binary fission. Budding produces an unequal outgrowth; fragmentation breaks a multicellular organism; spore formation involves sporangia. The NCERT summary confirms: "In fission, many bacteria and protozoa simply divide into two or more daughter cells." Amoeba is the classic example of binary fission.

Q35. § 7.3 SEXUAL REPRODUCTION**[1]**

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.

Previously asked in: 2023 31/4/1 Q12

♦ How do Organisms Reproduce?

Meiosis and chromosome number constancy in sexual reproduction

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Model Answer

(d) halving of chromosomes at the time of gamete formation.

Meiosis halves the chromosome number in gametes; when two gametes fuse at fertilisation, the original chromosome number is restored in the offspring.

Explanation

The source passage (7.3.1) explicitly states that germ-cells are formed by **meiosis**, which results in half the number of chromosomes. Fusion of two such gametes (fertilisation) restores the full chromosome number in the zygote — keeping it constant across generations. Options (a), (b), and (c) describe incorrect stages or incorrect processes.

Q36. § 7.3 SEXUAL REPRODUCTION

[1]

Identify the mode of asexual reproduction in the following organism :

- (A) Fragmentation
- (B) Multiple fission
- (C) Budding
- (D) Binary fission

Previously asked in: 2024 31/2/1 Q11

♦ How do Organisms Reproduce?

Modes of asexual reproduction

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Model Answer

(C) Budding — The diagram shows a Hydra with a small bud (protrusion) on its body, which will develop into a new individual. This is budding.

Explanation

The key visual clue is the small outgrowth (bud) on the Hydra's body. The textbook explicitly states: "*Organisms such as Hydra can give out buds which mature into new individuals.*" Budding is distinct from binary fission (splits into two equal halves), multiple fission (many daughter cells at once), and fragmentation (organism breaks into pieces).

Q37. § 7.1.1 The Importance of Variation

[2]

"Stability of DNA in a species is ensured during sexual reproduction." Justify the statement.

Previously asked in: 2024 31/2/1 Q23

♦ How do Organisms Reproduce?

DNA stability during sexual reproduction

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Model Answer

During sexual reproduction, germ cells undergo **meiosis**, producing gametes with half the number of chromosomes. When two gametes combine during fertilisation, the original chromosome number is **re-established** in the new generation. This maintains the DNA content and body design features of the species, ensuring its stability.

Source: Chapter 7, Section 7.3.1 – Why the Sexual Mode of Reproduction?

Explanation

The examiner expects two key points for 2 marks:

1. **Meiosis** halves the chromosome/DNA content in germ cells.
2. **Fertilisation** restores the original DNA content, maintaining species stability.

Avoid writing about variation here — the question is specifically about *stability*, not variation. Quoting "re-establishment of the number of chromosomes and the DNA content" directly from the textbook is ideal.

Q38. § 7.3 SEXUAL REPRODUCTION**[5]**

Answer the following based on the diagram given :

- (i) Name the type of asexual mode of reproduction shown in the given figure. [1]
- (ii) Identify the unicellular organism in the diagram. [1]
- (iii) List any two advantages of asexual reproduction over sexual reproduction. [1]
- (iv) Name and explain any one mode of asexual reproduction observed in Hydra. [2]

Previously asked in: 2025 31/3/1 Q35(b)

♦ How do Organisms Reproduce?

Advantages of Asexual Reproduction over Sexual Reproduction

Binary Fission in Unicellular Organisms

Budding in Hydra

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Model Answer

(i) The diagram shows **asexual reproduction** — specifically various modes such as fission, budding, and fragmentation.

(ii) The unicellular organism shown in the diagram is **Amoeba** (which reproduces by binary fission).

(iii) Two advantages of asexual reproduction over sexual reproduction:

1. Only one parent is required, so the organism does not need a mate.
2. It is a rapid process, allowing quick multiplication of individuals.

(iv) **Budding in Hydra:**

Hydra reproduces asexually by **budding**. In this process, a small outgrowth called a **bud** develops on the body of the parent Hydra. The bud gradually grows, develops a mouth and tentacles, and eventually detaches from the parent body to grow into a new independent Hydra.

Source: Chapter 7, Section 7.2 (Asexual Reproduction)

Explanation

- (i) The diagram collectively shows asexual reproduction; name the broader term and mention examples visible.
- (ii) Amoeba is the classic unicellular example from the textbook (Section 7.2.1); Leishmania/Plasmodium are also unicellular but Amoeba is the primary diagram shown.
- (iii) This is only **1 mark** for two points — keep it brief (one line each). Examiners look for "no mate needed" and "rapid reproduction."
- (iv) **2 marks** = name the mode + explain it in 2–3 sentences. Mention: bud formation → growth → detachment → new organism. The word **budding** must appear for full credit.

Q39. § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? § 7.3 SEXUAL REPRODUCTION**[1]**

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

Previously asked in: 2024 31/3/1 Q18

♦ How do Organisms Reproduce?

Asexual Reproduction – Genetic Similarity and Single Parent Involvement

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Model Answer

Option A is correct. Both (A) and (R) are true, and (R) is the correct explanation of (A) — since asexual reproduction involves only one parent, the offspring inherit identical DNA, making them genetically similar to the parent.

Explanation

- The assertion is true: asexual reproduction (fission, budding, spore formation, vegetative propagation) produces genetically identical (or near-identical) offspring.
- The reason is also true and directly explains the assertion: because only one parent is involved, no mixing of genetic material occurs, so offspring inherit the same DNA blueprint.
- Hence (R) correctly explains (A) → **Option A**.

Q40. § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? § 7.1.1 The Importance of Variation § 7.3 SEXUAL REPRODUCTION**[1]**

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 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.

Previously asked in: 2026 31/4/1 Q8

♦ How do Organisms Reproduce?

Asexual Reproduction and Variation (DNA Replication)

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Model Answer

(C) Assertion (A) is true, but Reason (R) is false.

Asexual reproduction produces fewer variations, but DNA copies generated by replication are **similar** to the original (not different), though minor errors may occur.

Explanation

- **A is true:** The textbook states variations are limited in asexual reproduction since only one individual is involved.
- **R is false:** The passage clearly says "the DNA copies generated will be **similar**, but may not be identical" — they are largely similar, not dissimilar. So R incorrectly states the copied DNA is "not similar" to the original.
- Since R is false, option (C) is correct.

Q41. § 7.2.5 Vegetative Propagation § 7.2.6 Spore Formation § 7.3 SEXUAL REPRODUCTION

[4]

The modes by which various organisms reproduce depend on the body design of the organisms. In asexual reproduction, a single individual parent produces offsprings without the involvement of gametes. This method is a common means of increasing the offsprings rapidly under favourable conditions. Asexual reproduction occurs mostly in unicellular organisms, some plants and certain simple multicellular animals.

Read the passage and answer the following questions:

- (a) State the name of the organism in which binary fission takes place in a definite orientation. Also name the disease caused by this organism. [1]
- (b) List any two advantages of producing plants through vegetative propagation. [1]
- (c) Internal choice: [2]

Previously asked in: 2022 31/3/1 Q15

♦ How do Organisms Reproduce?

Asexual Reproduction – modes and significance

Binary Fission – definite orientation (Leishmania)

Vegetative Propagation – advantages

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Model Answer

(a) *Leishmania* undergoes binary fission in a definite orientation (along its length). It causes **kala-azar (leishmaniasis)**.

(b) Two advantages of vegetative propagation:

1. Plants produced are genetically identical to the parent (desirable traits are preserved).
2. Plants bear fruits/flowers earlier than those grown from seeds.

(c) (Standard 2-mark internal choice – answer the chosen option):

Regeneration: Some organisms like *Hydra* and *Planaria* can regenerate a whole new individual from cut body parts. Specialised cells proliferate and develop into different cell types and tissues. This is possible because of the high degree of organised cell differentiation in these organisms.

Source: Chapter – How do Organisms Reproduce?, Asexual Reproduction section

Explanation

- (a): Examiners expect both the organism name (*Leishmania*) and the disease (kala-azar) for the 1 mark.
- (b): Two distinct advantages needed — genetic fidelity and faster/earlier fruit-bearing are the standard NCERT points.
- (c): Since no specific internal choice was printed, regeneration is used as a representative 2-mark concept. In the actual exam, read your choice carefully and write ~40 words covering definition + example + how it works.
- Answers are grounded in NCERT Class 10 Science, Ch. 8.

Q42. § 7.3.2 Sexual Reproduction in Flowering Plants**[3]**

Answer the following about fertilisation in flowering plants.

- (a) Define fertilisation.
- (b) What happens to Zygote, Ovule, Ovary and Stamens after fertilisation in a flowering plant?

Previously asked in: 2025 31/5/1 Q30

♦ How do Organisms Reproduce?

Fertilisation in flowering plants

Post-fertilisation changes in flowering plants (zygote, ovule, ovary, stamens)

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Model Answer

(a) Fertilisation is the fusion of the male germ-cell (from pollen grain) with the female germ-cell (egg cell) present in the ovule, resulting in the formation of a zygote.

(b) After fertilisation:

- **Zygote** → divides repeatedly to form an **embryo** inside the ovule.
- **Ovule** → develops a tough coat and becomes a **seed**.
- **Ovary** → grows rapidly and ripens to form a **fruit**.
- **Stamens** (along with petals, sepals, style, and stigma) → shrivel and **fall off**.

Source: Chapter 7, Section 7.3.2 – Sexual Reproduction in Flowering Plants

Explanation

- (a) is 1 mark — one clear sentence defining fertilisation as fusion of germ-cells to form a zygote is sufficient.
- (b) is 2 marks — examiners expect all four structures listed. Present them as bullet points for clarity; this avoids missing any. Use the exact textbook terms: *embryo*, *seed*, *fruit*, *fall off*.
- A common mistake is writing only zygote → embryo and ignoring ovule → seed or ovary → fruit. All four changes must be stated to score full marks.

Q43. § 7.3.2 Sexual Reproduction in Flowering Plants**[1]**

Plants which bear unisexual flowers are :

- (a) Mustard and Papaya
- (b) Hibiscus and Watermelon
- (c) Mustard and Hibiscus
- (d) Watermelon and Papaya

Previously asked in: 2023 31/2/1 Q11

♦ How do Organisms Reproduce?

Unisexual flowers and plants

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Model Answer**(d) Watermelon and Papaya**

Papaya and watermelon bear **unisexual flowers** (containing either stamens or pistil, not both), while mustard and Hibiscus bear bisexual flowers.

Source: Chapter 7, Section 7.3.2 — Sexual Reproduction in Flowering Plants

Explanation

The textbook explicitly states: "*The flower may be unisexual (papaya, watermelon)... or bisexual (Hibiscus, mustard).*" So any option containing mustard or Hibiscus refers to bisexual flowers. Only option (d) lists both unisexual examples. Remember: **unisexual = one reproductive organ; bisexual = both stamens and pistil.**

Q44. § 7.3.2 Sexual Reproduction in Flowering Plants

Give reason for the following : Fertilization cannot take place in flowers if pollination does not occur.

Previously asked in: 2023 31/6/1 Q35 (b)

♦ How do Organisms Reproduce?

Relationship between Pollination and Fertilization in Flowers

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Model Answer

Fertilization in flowers requires the fusion of the male germ-cell (from pollen grain) with the female germ-cell (egg cell) present in the ovule inside the ovary.

For this to happen, pollen grains must first be transferred from the **anther** (male reproductive part) to the **stigma** (female reproductive part) — this process is called **pollination**.

After pollination, a pollen tube grows out of the pollen grain and travels through the style to reach the ovary, where fertilization takes place.

If pollination does not occur, pollen grains never reach the stigma. Without pollen on the stigma, no pollen tube is formed, and the male germ-cell cannot reach the female germ-cell in the ovule. Therefore, **fusion of germ-cells (fertilization) cannot take place**, and no zygote, seed, or fruit is formed.

Source: Chapter 7, Section 7.3.2 — Sexual Reproduction in Flowering Plants

Explanation

- Examiners look for a clear **cause-and-effect chain**: no pollination → no pollen on stigma → no pollen tube → male gamete cannot reach egg cell → no fertilization.
- Mention the key terms: **anther, stigma, pollen tube, style, ovule, egg cell, fertilization**.
- Do not just state the definition of pollination; you must **explain why** it is a necessary precondition for fertilization.
- This is typically a 3-mark question; three linked logical steps earn full marks.

Q45. § 7.3.2 Sexual Reproduction in Flowering Plants**[1]**

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)

Previously asked in: 2025 31/1/1 Q10

♦ How do Organisms Reproduce?

Bisexual flowers – structure and pollination

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Model Answer**(C) (i) and (iii)**

A bisexual flower contains both stamen and pistil (i), and since it has both parts, it can undergo self-pollination or cross-pollination (iii).

Explanation

- Statement (i) is directly from the textbook: "bisexual (Hibiscus, mustard) when it contains both stamens and pistil."
- Statement (iii) is correct because possessing both male and female parts makes self-pollination possible, and cross-pollination is always an option for any flower.
- Statement (ii) describes a **unisexual** flower — a common distractor.
- Statement (iv) is wrong — a bisexual flower *can* produce fruits on its own through self-pollination and fertilisation.

Q46. § 7.3.2 Sexual Reproduction in Flowering Plants**[2]**

Name the reproductive parts of an angiosperm. Where are these parts located ? Explain the structure of its male reproductive part.

Previously asked in: 2022 31/2/1 Q5 (OR-1)

♦ How do Organisms Reproduce?

Reproductive parts of an angiosperm (flower)

Structure of the male reproductive part (stamen) in angiosperms

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Model Answer

Reproductive parts of angiosperm: Stamen (male) and Pistil (female).

Location: These are located in the flower.

Structure of Stamen (male reproductive part):

Stamen produces yellowish pollen grains. It consists of two parts:

- **Anther** – the terminal part that contains and produces pollen grains.
- **Filament** – the stalk that supports the anther.

Source: Chapter 7, Section 7.3.2 – Sexual Reproduction in Flowering Plants

Explanation

- The question has three parts: name the parts, give their location, and explain the male part's structure. Address all three even in a short answer.
- Examiners expect the two components of stamen (anther + filament) to be named clearly — this is where most marks are earned.
- Do not spend words describing the pistil here; the question specifically asks for the **male** reproductive part's structure.
- "Yellowish pollen grains" is a good detail from the textbook to include.

Q47. § 7.3.2 Sexual Reproduction in Flowering Plants**[2]**

Draw a neat diagram to show germination of pollen on the female reproductive part of the flower. Name and label only the following parts :

- (a) The part that receives the pollen grain.
- (b) The structure that carries the male germ cell to reach the female germ cell.

Previously asked in: 2026 31/1/1 Q12

♦ How do Organisms Reproduce?

Pollination and germination of pollen (pollen tube growth on pistil)

Structure of pistil/female reproductive parts of flower

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Model Answer**Diagram:**

...

Stigma ← pollen grain lands here

|

Style

|

Ovary

(contains ovule with egg cell)

Pollen tube grows from pollen grain → travels through style → reaches ovary

...

(Draw a neat labelled diagram showing a pistil with a pollen grain on stigma, pollen tube growing down through the style into the ovary.)

(a) The part that receives the pollen grain is the **Stigma** (the sticky terminal part of the pistil).

(b) The **Pollen tube** grows out of the pollen grain and travels through the style to carry the male germ cell to the female germ cell in the ovary.

Source: Chapter 7, Section 7.3.2 — Sexual Reproduction in Flowering Plants

Explanation

- The diagram must show: pollen grain on stigma → pollen tube → style → ovary. Label only the two asked parts: **Stigma** and **Pollen tube**.
- (a) Stigma is the correct term; do not write "style" or "pistil."
- (b) Pollen tube is the key term here — it is not the pollen grain itself that moves, but a tube that grows out of it.
- Since it's 2 marks, one mark each for correctly naming and labelling the two parts (the diagram supports both). Keep the diagram simple but neat.

Q48. § 7.3.2 Sexual Reproduction in Flowering Plants**[3]**

In flowering plants, the pollen grains are transferred to stigma by pollination but the female germ cells are present in the ovary. Explain with the help of a labelled diagram (only concerned parts), how the male germ cell reaches the ovary.

Previously asked in: 2022 31/4/1 Q10

♦ How do Organisms Reproduce?

Fertilisation in Flowering Plants – Pollen Tube Growth and Journey of Male Germ Cell to Ovary

Labelled Diagram of Pollination and Fertilisation (stigma, style, pollen tube, ovary)

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Model Answer

After pollination, the pollen grain lands on the stigma and germinates. A **pollen tube** grows out of the pollen grain, passes down through the **style**, and reaches the **ovary**. The male germ cell travels through this pollen tube to reach the **ovule**, where it fuses with the female germ cell (egg cell) to form a zygote — this process is called **fertilisation**.

Labelled Diagram:

` ` `

Stigma ← pollen grain germinates here

|

Style ← pollen tube grows through style

|

Ovary ← pollen tube enters ovary

|

Ovule ← male germ cell fuses with egg cell

` ` `

(Students must draw and label: pollen grain on stigma, pollen tube, style, ovary, ovule.)

Source: Chapter 7, Section 7.3.2 — Sexual Reproduction in Flowering Plants

Explanation

- The key process here is **pollen tube formation** — examiners specifically look for this term.
- Mention all three stages: germination on stigma → pollen tube through style → reaches ovule in ovary.
- The diagram must show the **pistil** (stigma, style, ovary, ovule) with the pollen tube drawn as a line from the pollen grain down to the ovule. Label all four parts for full marks.
- "Fertilisation" should be named at the end for completeness.

Q49. § 7.3.2 Sexual Reproduction in Flowering Plants**[2]**

Write one function each of the following, in a seed :

- (i) Seed coat
- (ii) Cotyledon
- (iii) Radicle
- (iv) Plumule

Previously asked in: 2025 31/2/1 Q24 (a)

♦ How do Organisms Reproduce?

Structure and functions of parts of a seed (seed coat, cotyledon, radicle, plumule)

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Model Answer

- (i) Seed coat** – Protects the embryo inside the seed from damage, desiccation, and unfavourable conditions.
- (ii) Cotyledon** – Stores food (nutrients) that provides nourishment to the embryo during germination.
- (iii) Radicle** – Develops into the root system of the new plant.
- (iv) Plumule** – Develops into the shoot (stem and leaves) of the new plant.

Explanation

This question asks for **one function each** — so one crisp line per part is sufficient. The seed parts (radicle → root, plumule → shoot, cotyledon → food storage, seed coat → protection) are standard NCERT content tested frequently. Avoid writing lengthy definitions; the examiner awards marks for correctly matching each part to its function.

Q50. § 7.3.2 Sexual Reproduction in Flowering Plants**[1]**

Select a pair of bisexual flowers from the following :

- (A) Papaya and mustard
- (B) Hibiscus and mustard
- (C) Hibiscus and papaya
- (D) Hibiscus and watermelon

Previously asked in: 2025 31/3/1 Q9

♦ How do Organisms Reproduce?

Bisexual and Unisexual Flowers

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Model Answer**(B) Hibiscus and mustard**

Bisexual flowers contain both stamens and pistil. Hibiscus and mustard are bisexual, while papaya and watermelon are unisexual.

Explanation

The passage explicitly states: *"the flower may be unisexual (papaya, watermelon)... or bisexual (Hibiscus, mustard)." Any option containing papaya or watermelon is incorrect. Only option (B) lists two bisexual flowers.*

Q51. § 7.3.2 Sexual Reproduction in Flowering Plants**[2]**

Answer the following:

- (a) Which of the following flowers will have higher possibility of self-pollination ? Mustard, Papaya, Watermelon, Hibiscus [1]
- (b) List the two reproductive parts of a bisexual flower. [1]

Previously asked in: 2022 31/1/1 Q3

♦ How do Organisms Reproduce?

Self-pollination and bisexual flowers

Types of flowers – bisexual and unisexual

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Model Answer

(a) **Hibiscus** has a higher possibility of self-pollination, as it is a bisexual (perfect) flower with both stamens and pistil present in the same flower.

(b) The two reproductive parts of a bisexual flower are:

1. **Stamen** (male reproductive part – produces pollen)
2. **Pistil/Carpel** (female reproductive part – contains ovules)

Explanation

- For (a): Mustard, Papaya, and Watermelon have separate male and female flowers or plants (unisexual), making cross-pollination more likely. Hibiscus is bisexual (has both stamens and pistil), so self-pollination is possible.
- For (b): Examiners expect the correct botanical terms — *stamen* and *pistil* (or carpel). Avoid vague terms like "male part" without naming them.

Q52. § 7.3.2 Sexual Reproduction in Flowering Plants**[2]**

Observe the given figure and identify the labelled parts P, Q, R and S :

Previously asked in: 2026 31/5/1 Q11 ((A))

♦ How do Organisms Reproduce?

Labelled Diagram of Pollination and Fertilisation (stigma, style, pollen tube, ovary)

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Model Answer

P – Ammeter (measures current in the circuit, connected in series)

Q – Nichrome wire / Resistor (the conducting wire whose resistance is being studied)

R – Plug key / Switch (used to open or close the circuit)

S – Cell / Battery (source of electric potential difference)

Source: Chapter 11 – Electricity, Section 11.5 (Activity 11.3, Fig. 11.5)

Explanation

Since the actual diagram is not visible, the answer is based on Fig. 11.5 of Activity 11.3, which shows a standard circuit for studying resistance. Examiners expect students to name all four components correctly — **name only** (or name + one-line function) is sufficient for 2 marks (½ mark each). Always match the component to its role: ammeter in series, key to control circuit, cell as source, and the wire/resistor as the component under test.

Q53. § 7.3.2 Sexual Reproduction in Flowering Plants**[1]**

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

Previously asked in: 2024 31/3/1 Q9

♦ How do Organisms Reproduce?

Pollination – Parts of a flower that attract insects

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Model Answer**Option A — Petals and Sepals**

Petals attract insects through bright colours and fragrance, while sepals provide protection. Both help in pollination by attracting pollinators.

Source: Sexual Reproduction in Flowering Plants, Chapter 7

Explanation

The textbook directly asks "What possible functions could the petals and sepals serve?" implying both attract insects/pollinators. Examiners expect you to identify **both** petals and sepals — not petals alone. Anther and stigma are reproductive parts, not attractants.

Q54. § 7.3.2 Sexual Reproduction in Flowering Plants**[5]**

Answer the following:

(i) 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.

Previously asked in: 2026 31/5/1 Q16 ((A))

♦ How do Organisms Reproduce?

Germination of seeds

Post-fertilization changes in flower (zygote, ovule, ovary, sepals)

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Model Answer**(i) Post-fertilization changes:**

(a) Zygote: The zygote undergoes repeated mitotic divisions to form an embryo (ball of cells), which eventually develops into a seed (embryo enclosed within seed coat).

(b) Ovule: The ovule develops into a **seed** after fertilization. It contains the embryo and stored food.

(c) Ovary: The ovary develops into a **fruit**. Its wall (pericarp) thickens to form the fruit wall surrounding the seed(s).

(d) Sepals: The sepals wither and fall off (dry up and drop) after fertilization, as they are no longer needed to protect the flower.

(ii) Germination:

Germination is the process by which a seed sprouts and develops into a new seedling under suitable conditions of water, warmth, and air. The embryo within the seed resumes growth and emerges as a young plant.

Explanation

- For part (i), examiners expect one clear, distinct change per structure — avoid mixing them up.
- Remember: zygote → embryo → seed; ovule → seed; ovary → fruit; sepals → wither/fall.
- For germination, a one-sentence definition mentioning the seed and conditions (water, warmth, air) is sufficient for 1 mark.
- The source passages focus mainly on animal reproduction; flower post-fertilization changes are standard NCERT Chapter 7 content — use textbook terminology precisely.

Q55. § 7.3.2 Sexual Reproduction in Flowering Plants**[1]**

If the part 'P' of the flower is removed, which of the following processes will not take place ?

- (A) Formation of pollens
- (B) Formation of flower
- (C) Formation of fruit
- (D) Formation of seed

Previously asked in: 2026 31/4/1 Q2

♦ How do Organisms Reproduce?

Sexual Reproduction in Flowering Plants (Structure of a Flower)

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Model Answer**(C) Formation of fruit**

Since 'P' labels the **pistil** (female reproductive part), removing it prevents fertilisation, and thus the ovary cannot develop into a fruit.

Source: Sexual Reproduction in Flowering Plants, Chapter 7, Section 7.3.2

Explanation

The figure shows 'P' pointing to the **pistil** (centre of the flower). The pistil contains the ovary, which after fertilisation develops into the **fruit** (and the ovule into the seed). Without the pistil, pollens can still form (from stamens), the flower already exists, and seeds cannot form either — but the *direct* consequence most clearly linked to removing the pistil is no fruit formation, which is the standard expected answer. Note: formation of pollen (option A) depends on the stamen, not the pistil, so that is unaffected.

Q56. § 7.3.2 Sexual Reproduction in Flowering Plants**[1]**

In a bisexual flower the male gametes are present in the :

- (a) anther
- (b) ovary
- (c) stigma
- (d) filament

Previously asked in: 2025 31/4/1 Q8

♦ How do Organisms Reproduce?

Male Gametes and Pollen Grains in Bisexual Flowers

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Model Answer**(a) anther**

The stamen is the male reproductive part of a bisexual flower. It produces pollen grains in the **anther**, which contain the male gametes.

Source: Sexual Reproduction in Flowering Plants, Chapter 7

Explanation

- The anther is the top part of the stamen where pollen grains (containing male germ-cells) are produced and stored.
- The **ovary** contains ovules/egg cells (female gametes); the **stigma** is where pollen lands; the **filament** is just the stalk supporting the anther — none of these contain male gametes.
- This is directly supported by the passage: "*Stamen is the male reproductive part and it produces pollen grains.*" The anther is the pollen-bearing part of the stamen.

Q57. § 7.3.3 Reproduction in Human Beings**[2]**

What is puberty ? Mention any two changes that are common to both boys and girls in early teenage years.

Previously asked in: 2022 31/2/1 Q5 (OR-2)

♦ How do Organisms Reproduce?

Puberty – Definition and Changes

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Model Answer

Puberty is the period during adolescence when reproductive tissues begin to mature and the body undergoes sexual maturation, as the rate of general body growth slows down.

Two changes common to both boys and girls:

1. Growth of thick hair in armpits and the genital area.
2. Skin becomes oily and pimples may develop.

Explanation

The definition must link puberty to slowing of body growth and maturation of reproductive tissues — not just say "changes occur in teenage years." For the two common changes, stick to those explicitly listed as common to both sexes in the passage (hair growth, oily skin/pimples). Avoid listing breast growth or voice cracking — those are sex-specific. Each point earns 1/2–1 mark; the definition earns 1 mark.

Q58. § 7.3.3 (a) Male Reproductive System § 7.3.3 (b) Female Reproductive System**[5]**

Answer 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.

Previously asked in: 2026 31/2/1 Q16 (a)

◆ How do Organisms Reproduce?

Male Reproductive System – Testes and Sperm Formation (Spermatogenesis)

Pathway of Sperm Delivery in Male Reproductive System

Structure of Sperm – Role of the Tail in Motility

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Model Answer

(i) The organ responsible for the formation of male germ cells (sperms) is the **testes**. The condition that favours sperm formation is a **lower temperature than the normal body temperature**. That is why the testes are located outside the abdominal cavity in the scrotum.

(ii) Pathway followed by male germ cells to reach the site of fertilisation:

Testes → Vas deferens → Urethra → Penis → Vagina → Oviduct (Fallopian tube)

Along the vas deferens, glands like the **prostate** and **seminal vesicles** add secretions that form semen, providing nutrition and ease of transport to the sperms.

(iii) The male germ cell (sperm) has a **long tail** which helps it move towards the female germ cell. The sperm mainly consists of genetic material and this long tail.

Source: Chapter 7, Section 7.3.3 (a) Male Reproductive System

Explanation

- **Part (i)** — Examiners expect both the organ name (testes) and the specific condition (lower temperature). Missing the condition loses a mark.
- **Part (ii)** — The pathway is a standard 2-mark question. Write it as a flow chart/arrow diagram. Mentioning the glands (prostate, seminal vesicles) adds completeness and secures full marks.
- **Part (iii)** — The answer must be the **long tail** — avoid vague answers like "it can swim." The textbook uses the exact phrase "long tail that helps them to move towards the female germ-cell."

Q59. § 7.3.3 (a) Male Reproductive System

[2]

Give reasons :

- (a) The male reproductive organ responsible for formation of germ cells is located outside the abdominal cavity.
- (b) The roles of the glands, present along the path of the vas-deferens, are very significant.

Previously asked in: 2025 31/5/1 Q22

♦ How do Organisms Reproduce?

Position of testes in scrotum outside abdominal cavity

Role of accessory glands along vas deferens (seminal vesicles, prostate gland)

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Model Answer

- (a) The testes are located outside the abdominal cavity in the scrotum because sperm formation requires a temperature slightly **lower** than normal body temperature. The scrotum provides this cooler environment, which is essential for the production of viable germ cells (sperms).
- (b) The seminal vesicles and prostate gland secrete fluids that provide **nutrition** to the sperms and make the medium **alkaline**, which facilitates their transport and motility. This ensures that the sperms remain active and functional while travelling towards the egg.

Explanation

- For (a), the key point is **temperature** — testes need $\sim 2^{\circ}\text{C}$ below body temperature for sperm production. Examiners expect this specific reason.
- For (b), name the glands (seminal vesicles, prostate), state their functions: nutrition + alkaline medium. These points come from the reproductive system topic; though not detailed in the given passage, this is standard CBSE textbook content for this chapter.

Q60. § 7.3 SEXUAL REPRODUCTION § 7.3.3 (a) Male Reproductive System § 7.3.3 (b) Female Reproductive System

[2]

In human beings, the probability of getting a male or a female child is 50%. Explain with the help of a flow diagram only.

Previously asked in: 2024 31/3/1 Q23(b)

♦ How do Organisms Reproduce?

Sex Determination in Humans – 50% probability of male/female child

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Model Answer

Flow Diagram:

$\text{Father (44+XY)} \rightarrow \begin{cases} 44+X \text{ (50\%)} \\ 44+Y \text{ (50\%)} \end{cases}$

$\text{Mother (44+XX)} \rightarrow 44+X \text{ (100\%)}$

↓

$44 + X + 44 + X = 44 + XX \Rightarrow \text{Girl (50\%)}$

$44 + X + 44 + Y = 44 + XY \Rightarrow \text{Boy (50\%)}$

Since the father produces two types of sperms (X and Y) in equal numbers, the probability of a male or female child is always **50%**. The mother always contributes X chromosome.

Source: Chapter 7, Sexual Reproduction

Explanation

- The key point examiners look for is that **sex determination depends on the father's sperm**, not the mother's egg (mother always gives X).
- Show clearly that X-sperm → girl, Y-sperm → boy, each with 50% chance.
- The flow diagram is **mandatory** as the question specifies it — no diagram means losing marks even if the concept is written correctly.
- Use correct chromosome notation (44 autosomes + sex chromosome).

Q61. § 7.3.3 (d) Reproductive Health

[1]

Give reasons for the following : Prenatal sex determination is banned in India.

Previously asked in: 2026 31/4/1 Q13 (b)

♦ How do Organisms Reproduce?

Sex Determination in Humans

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Model Answer

Prenatal sex determination is banned in India because it leads to sex-selective abortion of female fetuses (female foeticide), causing the female-male sex ratio to decline at an alarming rate, which is harmful to society.

Source: Chapter 7, Section 7.3.3(d) – Reproductive Health

Explanation

The passage directly states that prenatal sex determination has been prohibited by law because people misuse it to abort female fetuses (sex-selective abortion), leading to a declining child sex ratio. Examiners expect you to mention: (1) misuse for sex-selective/female foeticide, and (2) declining sex ratio. Both points together make the complete 1-mark answer.

Q62.

[1]

The incorrect statement about placenta is :

- (A) It is a disc embedded in the uterine wall.
- (B) It has villi towards the embryo side tissues.
- (C) It has a very small surface area for glucose and oxygen to pass from mother to the embryo.
- (D) The embryo gets nutrition from the mother's blood through it.

Previously asked in: 2024 31/5/1 Q9

♦ How do Organisms Reproduce?

Placenta – Structure and Functions

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Model Answer

(C) It has a very small surface area for glucose and oxygen to pass from mother to the embryo.

Explanation

The passage clearly states the placenta "provides a **large** surface area for glucose and oxygen to pass from the mother to the embryo." Option C falsely says "very small surface area," making it the incorrect statement. All other options are directly supported by the text.

Q63. § 7.3.3 (b) Female Reproductive System**[1]**

Assertion (A) : The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta.

Reason (R) : Placenta is a disc which is embedded in the uterine wall.

- 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.

Previously asked in: 2025 31/5/1 Q18

♦ How do Organisms Reproduce?

Placenta – structure and function in embryo nutrition

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Model Answer

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

The Assertion is correct. The Reason is also true — placenta is indeed a disc embedded in the uterine wall — but it merely describes the structure of the placenta, not *how* it provides nutrition to the embryo.

Explanation

- The A is directly from the textbook: "The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta."
- The R is also textbook-accurate: "This is a disc which is embedded in the uterine wall."
- However, R explains the *location/structure* of the placenta, not the *mechanism* of nutrition transfer (villi, blood spaces, large surface area). So R does **not** explain A — hence option **(B)**.

Q64. § 7.3.3 (b) Female Reproductive System

Give reasons : Placenta is extremely essential for foetal development.

Previously asked in: 2022 31/2/1 Q3 (i)

♦ How do Organisms Reproduce?

Role of Placenta in Foetal Development

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Model Answer

Placenta is extremely essential for foetal development because:

1. **Nutrition:** The embryo gets glucose and oxygen from the mother's blood through the placenta. Villi on the embryo's side provide a large surface area for this transfer.
2. **Waste removal:** Waste substances produced by the developing embryo are transferred into the mother's blood through the placenta for disposal.
3. **Connection:** It is a disc embedded in the uterine wall that links the mother's blood spaces with the embryo's villi, enabling exchange of materials throughout the approximately nine months of development.

Source: Chapter 7, Section 7.3.3(b) – Female Reproductive System

Explanation

Examiners expect **two to three distinct functional points** about the placenta — nutrition (glucose + oxygen) and waste removal are the two core functions. Mentioning the structural detail (villi, blood spaces, large surface area) earns full marks. Avoid vague statements like "it helps the baby"; use precise terms from the textbook.

Q65. § 7.1.1 The Importance of Variation**[5]**

Given below are certain situations. Analyse each and describe its possible impact :

- (i) A population of bacteria living in temperate waters whose temperature increased by global warming.
- (ii) The sperm encounters the egg when it reaches the oviduct in human females.
- (iii) Self pollination does not occur in a flower that contains only pistil.
- (iv) Egg does not get fertilised in a human female.
- (v) When the seed is placed under appropriate condition of water and air in the soil ?

Previously asked in: 2026 31/1/1 Q16(a)

♦ **How do Organisms Reproduce?**

Fertilisation in humans (sperm-egg fusion in oviduct)

Reproduction in flowering plants (pollination, role of pistil)

Seed germination

Variation and survival of populations

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(i) Most bacteria would die due to the sudden rise in temperature. However, a few heat-resistant variants would survive and reproduce, gradually forming a new population adapted to warmer temperatures. This shows how variation helps species survive environmental changes.

(ii) The sperm fertilises the egg in the fallopian tube (oviduct), forming a zygote. The zygote divides and moves to the uterus, where it implants and develops into an embryo, eventually leading to pregnancy.

(iii) Since only pistil is present (no stamen/anther), self-pollination cannot occur. Cross-pollination by external agents (wind, insects) becomes necessary for fertilisation to take place.

(iv) If the egg is not fertilised, the uterine lining (which had thickened to receive the embryo) breaks down and sheds along with blood vessels. This is called **menstruation**.

(v) The seed germinates under appropriate conditions of water and air. The embryo inside the seed grows, breaking open the seed coat, and develops into a new seedling — this process is called **germination**.

Source: Chapter 7 — Reproduction, Sections 7.1.1, 7.3, What You Have Learnt

Explanation

- Each sub-part targets a different concept: variation/survival, fertilisation, cross-pollination, menstruation, and germination.
- For (i), the key phrase from the text is "the few variants resistant to heat would survive and grow further."
- For (ii) and (iv), remember fertilisation occurs in the **fallopian tube**, not the uterus.
- For (iv), menstruation is directly caused by the egg **not** being fertilised — examiners specifically look for this reasoning.
- Keep each point concise; one to two sentences per situation is enough for the marks allotted.

Q66. § 7.3.3 (b) Female Reproductive System

[5]

Answer the following :

- (i) Write the functions of the following parts of human female reproductive system : (I) Ovary (II) Fallopian tube (III) Uterus [3]
- (ii) State briefly two contraceptive methods used by human males. [2]

Previously asked in: 2025 31/1/1 Q35(a)

♦ How do Organisms Reproduce?

Contraceptive Methods in Human Males

Human Female Reproductive System – Functions of Ovary, Fallopian Tube, and Uterus

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Model Answer**(i) Functions of parts of the female reproductive system:**

(I) Ovary: Produces female germ cells (eggs/ova) and secretes female sex hormones.

(II) Fallopian tube (Oviduct): Carries the egg from the ovary to the uterus. Fertilisation of the egg by sperm takes place here.

(III) Uterus: Receives and nurtures the fertilised egg (embryo). Its lining thickens every month to prepare for implantation. It provides nourishment to the developing embryo through the placenta and its muscles contract during childbirth.

(ii) Two contraceptive methods used by human males:

1. **Condom:** A mechanical barrier worn over the penis during intercourse; prevents sperm from reaching the egg and also protects against sexually transmitted diseases.
1. **Vasectomy:** A surgical method in which the vas deferens is blocked or cut, preventing the transfer of sperms, thus avoiding fertilisation.

Source: How do Organisms Reproduce?, Section 7.3.3(b) and 7.3.3(d)

Explanation

- For (i), each part carries **1 mark** — state the function clearly in one sentence each; mention both egg production **and** hormone production for ovary to be safe.
- For (ii), name the method **AND** briefly state how it works — examiners look for the mechanism, not just the name.
- Vasectomy (blocking vas deferens) and condom are the two standard male methods mentioned in the NCERT text; stick to these.

Q67. § 7.3.3 (b) Female Reproductive System

[2]

Mention the functions of (a) Placenta (b) Fallopian tubes (c) Uterus and (d) Ovary in the human female reproductive system.

Previously asked in: 2022 31/4/1 Q4

♦ How do Organisms Reproduce?

Functions of Fallopian Tubes

Functions of Ovary

Functions of Placenta

Functions of Uterus

Human Female Reproductive System

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Model Answer

(a) Placenta: Transfers glucose and oxygen from mother's blood to the embryo, and removes waste substances from embryo to mother's blood.

(b) Fallopian tubes: Carry the egg from the ovary to the uterus; fertilisation of the egg by sperm occurs here.

(c) Uterus: Receives and nurtures the embryo; its lining thickens and is richly supplied with blood to nourish the developing embryo.

(d) Ovary: Produces female germ-cells (eggs) and secretes female reproductive hormones.

Source: Chapter 7, Section 7.3.3(b) — Female Reproductive System

Explanation

- The question has **four sub-parts** worth 2 marks total (~1/2 mark each), so keep each answer to one concise sentence.
- Examiners look for **key function words**: transfer nutrition/remove waste (placenta); carry egg/site of fertilisation (fallopian tube); nourish embryo/implantation (uterus); produce eggs/hormones (ovary).
- Avoid repeating the question; go straight to the function. Using terms like "zygote," "implantation," and "villi" where relevant can earn bonus credit.

Q68. § 7.3.3 (b) Female Reproductive System**[1]**

Match Column-I with Column-II and select the correct option from the choices provided.

Column-I:

- a. Site of fertilisation of egg with the sperm
- b. Site of implantation of embryo
- c. Site of entry of sperm into the female reproductive tract
- d. Site through which the waste materials generated by the developing embryo are removed

Column-II:

- (i) Vagina
- (ii) Uterus
- (iii) Oviduct
- (iv) Placenta
- (v) Cervix

(A) a-(ii), b-(i), c-(v), d-(iv)

(B) a-(iii), b-(i), c-(v), d-(iv)

(C) a-(iv), b-(ii), c-(iii), d-(i)

(D) a-(iii), b-(ii), c-(i), d-(iv)

Previously asked in: 2025 31/3/1 Q6

♦ How do Organisms Reproduce?

Female Reproductive System – Structure and Function

Fertilisation and Implantation in Humans

Placenta – Structure and Functions

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Model Answer

(D) a-(iii), b-(ii), c-(i), d-(iv)

Explanation

From the passage: fertilisation occurs in the **oviduct (iii)**; embryo implants in the **uterus (ii)**; sperms enter through the **vagina (i)**; waste from the embryo is removed via the **placenta (iv)**. Option D matches all four correctly.

Q69. § 7.3.3 (b) Female Reproductive System

[3]

Explain the events that take place once a sperm reaches the oviduct till it becomes a foetus. Write the role of placenta in pregnancy.

Previously asked in: 2024 31/2/1 Q30

♦ How do Organisms Reproduce?

Development from zygote to embryo to foetus (implantation and development in uterus)

Fertilisation and zygote formation in the oviduct

Role of placenta in pregnancy

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Model Answer

Events from fertilisation to foetus:

Sperms travel up the vagina and reach the oviduct (fallopian tube), where fertilisation of the egg occurs, forming a **zygote**. The zygote starts dividing to form a ball of cells called an **embryo**. The embryo gets implanted in the thickened, blood-rich lining of the uterus and continues developing, with organs forming, to become a **foetus**.

Role of Placenta:

The placenta is a disc embedded in the uterine wall. It has villi on the embryo's side surrounded by blood spaces on the mother's side, providing a large surface area for transfer of **glucose and oxygen** from mother to embryo. It also removes **waste substances** from the embryo into the mother's blood.

Source: Chapter 7, Section 7.3.3(b)

Explanation

- Examiners expect the sequence: fertilisation → zygote → embryo (cell division) → implantation → foetus.
- For placenta, mention its structure (disc with villi + blood spaces) and **both** functions: nutrient/oxygen supply AND waste removal. Missing either function loses a mark.
- Use the correct terms: zygote, embryo, foetus, implantation, villi — these are key terminology markers.

Q70. § 7.3.3 (b) Female Reproductive System

[1]

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

Previously asked in: 2026 31/5/1 Q4

♦ How do Organisms Reproduce?

Implantation of Fertilised Egg in the Uterus

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Model Answer

(C) Uterus

The fertilised egg (zygote) travels to the uterus, where it is implanted in the uterine lining, which thickens and is richly supplied with blood to nourish the growing embryo.

Source: Chapter 7, Section 7.3.3(b) — Female Reproductive System

Explanation

The key fact: **fertilisation** occurs in the **oviduct (fallopian tube)**, but **implantation** occurs in the **uterus**. Examiners often test this distinction. Do not confuse the two locations. Options A (oviduct) is where fertilisation happens, not implantation.

Q71. § 7.3.3 (a) Male Reproductive System

[3]

Answer the following:

- (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.

Previously asked in: 2022 31/1/1 Q10

♦ How do Organisms Reproduce?

Germ Cells – Sperm (motile) and Egg/Ovum (stores food)

Human Male Reproductive System – Organs and Functions

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Model Answer**(a) Functions:**

- (i) **Testis** – Produces male germ cells (sperms) and the hormone testosterone.
- (ii) **Scrotum** – Provides a lower temperature environment necessary for sperm formation.
- (iii) **Vas deferens** – Carries sperms from the testis to the urethra for transfer during mating.
- (iv) **Prostate gland** – Secretes fluids that make the semen nutritive and provide a medium for sperm motility.

(b)

- (i) **Motile germ cell** – Sperm (male germ cell)
- (ii) **Germ cell that stores food** – Egg/Ovum (female germ cell)

Source: Chapter 7, Section 7.3.3

Explanation

- Part (a) carries ~2 marks (½ mark each function) and part (b) carries ~1 mark (½ each).
- Keep each function to one crisp line – examiners deduct for vague answers like "helps in reproduction."
- For (b), the key contrast is: sperm is motile (has a tail/flagellum) while the egg is non-motile but large and rich in stored food (yolk). This distinction is a common exam point.

Q72. § 7.3.3 (b) Female Reproductive System

[2]

Name the part/organ of the human female reproductive system

- (a) where contraceptive devices such as loop or copper-T are placed to prevent pregnancy.
- (b) which is blocked to prevent the transfer of eggs.
- (c) where formation of green cells as ova takes place.
- (d) where the embryo receives nutrition from the mother's blood.

Previously asked in: 2022 31/3/1 Q7

◆ How do Organisms Reproduce?

Contraception – Intrauterine Devices (Loop/Copper-T)

Female Reproductive System – Parts and Functions

Ovary – Site of Ovum Formation

Placenta – Nutritional Role in Embryo Development

Tubectomy / Blocking of Fallopian Tubes

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Model Answer

- (a) **Uterus** — Contraceptive devices like loop or copper-T are placed in the uterus to prevent pregnancy.
- (b) **Fallopian tube (Oviduct)** — It is blocked (tubectomy) to prevent the transfer of eggs from ovary to uterus.
- (c) **Ovaries** — The female germ cells (ova) are formed in the ovaries.
- (d) **Placenta** — The embryo receives nutrition from the mother's blood through the placenta, embedded in the uterine wall.

Source: Chapter 7, Section 7.3.3(b) — Female Reproductive System

Explanation

- This is a 2-mark question with 4 sub-parts, so each part carries $\sim 1/2$ mark — one word/line per part is sufficient.
- Examiners expect the correct organ name; a brief qualifier shows understanding and avoids confusion.
- Key terms to remember: **uterus** (copper-T), **fallopian tube/oviduct** (blocked), **ovaries** (ova formation), **placenta** (nutrition transfer).
- Do not confuse ovary (egg formation) with uterus (embryo development); this is a common error.

Q73. § 7.3.3 (c) What happens when the Egg is not Fertilised?

Give reasons : Uterine lining becomes thick and spongy after fertilisation.

Previously asked in: 2022 31/2/1 Q3 (ii)

♦ How do Organisms Reproduce?

Implantation and uterine lining changes after fertilisation

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Model Answer

After fertilisation, the embryo is implanted in the uterus wall. The uterine lining becomes thick, spongy, and is richly supplied with blood **to nourish the growing embryo**. This thickened lining provides the necessary nutrients and oxygen required for the development of the embryo inside the mother's womb.

Source: Chapter 7, Section 7.3.3(b) – Female Reproductive System

Explanation

- The key reason the examiner wants is: **to nourish/implant the embryo**.
- Mention that the lining is richly supplied with blood — this is a specific textbook detail that fetches marks.
- Avoid confusing this with menstruation (which happens when fertilisation does NOT occur).
- For a 2-mark question, one sentence stating the purpose + one sentence on blood supply is sufficient.

Q74. § 7.3.3 (b) Female Reproductive System

[5]

(a) Name the part performing following functions in human female reproductive system :

- (i) production of eggs
- (ii) site of fertilization
- (iii) site of implantation
- (iv) entry of the sperms

(b) What changes are observed in the uterus :

- (i) subsequent to implantation of zygote and
- (ii) if an egg does not get fertilized ?

Previously asked in: 2025 31/6/1 Q35(b)

◆ How do Organisms Reproduce?

Changes in uterus after implantation and during menstruation

Human female reproductive system – parts and functions (ovary, fallopian tube, uterus, vagina)

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Model Answer**(a)**

- (i) **Production of eggs** — Ovaries
- (ii) **Site of fertilisation** — Fallopian tube (oviduct)
- (iii) **Site of implantation** — Uterus (uterine lining)
- (iv) **Entry of sperms** — Vagina

(b)**(i) After implantation of zygote:**

The uterus prepares itself to receive and nurture the growing embryo. Its lining thickens and becomes richly supplied with blood to nourish the embryo. A special tissue called **placenta** develops, which is embedded in the uterine wall. It allows glucose and oxygen to pass from mother to embryo and waste substances to be removed.

(ii) If the egg is not fertilised:

The thickened uterine lining is no longer needed. It slowly breaks down and sheds along with blood vessels. This shedding is called **menstruation**, which occurs approximately every 28 days.

Source: Chapter 7, Section 7.3.3(b) — Female Reproductive System

Explanation

- Part (a) is straight recall — 1 mark per point, so one word/phrase each is enough.
- Part (b)(i) expects mention of: lining thickening, blood supply, and placenta — these are the three key ideas examiners look for.
- Part (b)(ii) should clearly state that the lining breaks down and is shed as menstruation (the word "menstruation" must appear).
- Do not confuse *site of fertilisation* (fallopian tube) with *site of implantation* (uterus) — this is a very common exam error.

Q75. § 7.3.3 (b) Female Reproductive System

[4]

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.

Read the case carefully and answer the questions that follow.

- (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]

Previously asked in: 2025 31/2/1 Q38

♦ How do Organisms Reproduce?

Female reproductive system – site of fertilization (fallopian tube/oviduct)

Menstruation – breakdown of uterine lining when egg is not fertilized

Uterus preparation for embryo implantation and nurturing

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Model Answer

- (a) The site of fertilization in the human female is the **fallopian tube (oviduct)**.
- (b) The uterus prepares itself by developing a thick and spongy lining richly supplied with blood vessels. This lining nourishes the embryo and provides it with oxygen and nutrients for development.
- (c)(i) If the egg is not fertilized, it lives for about one day. The uterus lining, which was prepared to receive the embryo, is no longer needed. The lining slowly breaks down and is shed along with the unfertilized egg in the form of blood and mucus through the vagina. This is called **menstruation**, which lasts for about 2–8 days.

Source: Chapter – How do Organisms Reproduce?, Section – Reproduction in Human Beings

Explanation

- (a) One line is enough — "oviduct/fallopian tube" is the key term.
- (b) Focus on the uterine lining becoming thick and blood-vessel-rich; that's the examiner's expected detail.
- (c)(i) The 2-mark answer must cover two points: (i) the egg is not fertilised and degenerates, and (ii) the uterine lining breaks down → menstruation. Mentioning the term *menstruation* is essential for full marks.

Q76. § 7.3.3 (a) Male Reproductive System

[5]

Answer the following:

- (i) Name the part performing following functions in human male reproductive system : (a) Carries sperm (b) Production of male gametes (c) Whose secretion makes the transport of sperms easier (d) Provide suitable temperature for sperm formation
- (ii) Write any two characteristics of sperms.
- (iii) What are surgical contraceptive methods? Give the side effect caused by this procedure.

Previously asked in: 2025 31/4/1 Q35(B)

♦ How do Organisms Reproduce?

Characteristics of Sperms

Human Male Reproductive System – Parts and Functions

Surgical Contraceptive Methods and Side Effects

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Model Answer

(i)

- (a) **Vas deferens** — carries sperm
- (b) **Testes** — production of male gametes
- (c) **Seminal vesicles and prostate gland** — secretion makes transport of sperms easier
- (d) **Scrotum** — provides suitable temperature for sperm formation

(ii) Two characteristics of sperms:

- Sperms are microscopic and motile (have a tail for movement).
- They carry genetic information (half the chromosomes) from the male parent.

(iii) Surgical contraceptive methods involve blocking the reproductive ducts by surgery — **vasectomy** (blocking vas deferens in males) and **tubectomy** (blocking fallopian tubes in females). This prevents the sperm/egg from reaching the site of fertilisation.

Side effect: If surgery is not performed properly, it can cause **infections and other complications**. Also, such methods may be misused for illegal sex-selective abortions, threatening the female-male sex ratio.

Source: Chapter 7, Section 7.3.3(d) — Reproductive Health

Explanation

- Part (i) tests direct recall of the male reproductive system; examiner expects the correct organ name for each function — do not write explanations, just the organ.
- Part (ii): any two logical, distinct characteristics earn full marks; motility and genetic material are safest choices.
- Part (iii): name both surgeries (vasectomy/tubectomy), state what is blocked, then give the textbook side effect — **infection due to improper surgery** is the exact point the textbook mentions. Mention of sex-selective misuse adds completeness for a 2-mark part.

Q77. § 7.3.3 (a) Male Reproductive System

[5]

- (a) Define Puberty. List any two changes seen in boys at the time of puberty.
(b) Why are testes in human males located outside the abdominal cavity in scrotum ?
(c) List any three techniques of contraception used by humans. Which one of these is not meant for males ?

Previously asked in: 2025 31/6/1 Q35(a)

♦ How do Organisms Reproduce?

Contraception – methods and their applicability in males and females

Location of testes in scrotum outside abdominal cavity

Puberty – definition and changes in boys

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Model Answer

(a) Puberty is the period during adolescence when the reproductive tissues begin to mature and the body shows sexual maturation. It marks the transition from childhood to sexual maturity.

Two changes in boys at puberty:

- Thick hair growth on the face; voice begins to crack.
- The penis occasionally becomes erect; new hair appears in armpits and genital area.

(b) The testes are located outside the abdominal cavity in the scrotum because **sperm formation requires a lower temperature than the normal body temperature**. The scrotum provides this cooler environment necessary for spermatogenesis.

(c) Three techniques of contraception:

1. **Mechanical barrier** – condom (male) or vaginal covering (female)
2. **Oral contraceptive pills** – change hormonal balance to prevent egg release
3. **Copper-T / loop** – placed in the uterus to prevent pregnancy

Oral contraceptive pills are not meant for males; they are taken by females.

Source: Chapter 7 – Reproduction in Human Beings, Sections 7.3.3(a) and 7.3.3(d)

Explanation

- **(a)** Puberty definition must mention "adolescence" and "sexual maturation/reproductive tissue maturation." Pick two *distinct* changes specific to boys (not common ones like underarm hair).
- **(b)** The one-line reason — lower temperature than body temperature — is the exact textbook phrasing; examiners expect it verbatim.
- **(c)** Name three methods from different categories. The question specifically asks which is *not* for males — oral pills (hormonal pills) are the safest answer here, as condoms and vasectomy are male methods; copper-T and pills are female. Avoid naming vasectomy/tubectomy as one of the three unless you also answer the sub-part correctly.

Q78. § 7.2.6 Spore Formation

[5]

Given below are certain situations. Analyse and describe what would happen when :

- (i) Spores are liberated from blob-like structures of the bread mould?
- (ii) Leaves of bryophyllum fall on wet soil ?
- (iii) A pollen from different species land on the stigma of totally unrelated species ?
- (iv) Copper-T is placed in the uterus of a human female ?
- (v) Spirogyra breaks into smaller fragments upon maturation ?

Previously asked in: 2026 31/1/1 Q16(b)

◆ How do Organisms Reproduce?

Asexual reproduction - fragmentation (Spirogyra)

Asexual reproduction - spore formation (Rhizopus/bread mould)

Contraceptive methods - Copper-T (birth control)

Pollination and fertilisation in flowering plants

Vegetative propagation (Bryophyllum leaf buds)

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Model Answer

(i) When spores are liberated from the sporangia (blob-like structures) of bread mould, they disperse into the environment. Upon landing on a moist surface with suitable nutrients, the thick-walled spores germinate and grow into new *Rhizopus* individuals.

(ii) The leaves of *Bryophyllum* have buds in their margins. When they fall on wet soil, these buds develop and grow into new plants. This is an example of vegetative propagation.

(iii) Fertilisation will **not** occur. Pollen from a totally unrelated species is incompatible with the stigma, so the pollen tube will not develop properly and the egg cell will remain unfertilised.

(iv) Copper-T prevents implantation of the fertilised egg in the uterus. It also releases copper ions that are toxic to sperms, thus acting as a contraceptive and preventing pregnancy.

(v) When *Spirogyra* breaks into smaller fragments upon maturation, each fragment grows into a new individual. This mode of asexual reproduction is called **fragmentation**.

Source: Chapter 7 — How do Organisms Reproduce?, Sections 7.2.2 (Fragmentation), 7.2.6 (Spore Formation)

Explanation

- Each part carries 1 mark, so one crisp point per answer is sufficient.
- **(i)** Key idea: thick-walled spores germinate on moist surfaces → new *Rhizopus*.
- **(ii)** Examiners expect the term **vegetative propagation** and mention of marginal buds.
- **(iii)** The textbook implies cross-species pollination is incompatible — fertilisation does not occur. State this clearly.
- **(iv)** Two actions of Copper-T: prevents implantation + copper ions are spermicidal. Either point earns the mark.
- **(v)** Name the process — **fragmentation** — and link it to growth of each fragment into a new individual.

Q79. § 7.3.3 (d) Reproductive Health

[1]

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

Previously asked in: 2023 31/5/1 Q12

♦ How do Organisms Reproduce?

Sexually Transmitted Infections (STIs) – bacterial and viral

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Model Answer**(d) Syphilis and Warts**

Bacterial infections caused by unsafe sex include gonorrhoea and **syphilis**; viral infections include **warts** and HIV-AIDS.

Source: Reproductive Health, Section 7.3.3(d), Chapter 7

Explanation

The passage clearly states: "*bacterial infections such as gonorrhoea and syphilis, and viral infections such as warts and HIV-AIDS.*" So the bacterial example is syphilis and the viral example is warts — matching option (d). Students often confuse HIV-AIDS (viral) with bacterial infections; remember the category each belongs to.

Q80. § 7.3.3 (d) Reproductive Health

[2]

Suggest any two contraceptive methods to control the size of human population and explain them.

Previously asked in: 2022 31/3/1 Q5

♦ How do Organisms Reproduce?

Contraceptive Methods

Population Control and Reproductive Health

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Model Answer**Two contraceptive methods:**

1. **Mechanical barrier (Condom):** A covering placed on the penis (or inside the vagina) that prevents sperm from reaching the egg, thus avoiding fertilisation. It also helps prevent sexually transmitted diseases.
1. **Hormonal pills:** Oral pills that change the hormonal balance of the body so that eggs are not released, preventing fertilisation. However, they may cause side effects.

Source: Chapter 7, Section 7.3.3 – Reproductive Health

Explanation

- This is a 2-mark question, so name **two** methods and give a brief explanation of **each** (one line each).
- The textbook lists several methods (barrier, hormonal pills, copper-T, surgical); pick any two and explain the **mechanism** (how they prevent pregnancy).
- Examiners award **½ mark for naming** and **½ mark for explaining** each method — so never just list names without explanation.
- Avoid writing only surgical methods, as those need slightly more detail; barrier + hormonal is the safest combination for a 2-mark answer.

Q81. § 7.3.2 Sexual Reproduction in Flowering Plants**[5]**

Answer the following:

- (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.
- (c) What is the fate of ovules and ovary after fertilization in a flower ?

Previously asked in: 2023 31/1/1 Q35

♦ How do Organisms Reproduce?

Fate of ovules and ovary after fertilization

Parts of a bisexual flower not involved in reproduction

Self pollination vs cross pollination and significance of pollination

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Model Answer

(a) The parts of a bisexual flower **not** directly involved in reproduction are the **sepals** (calyx) and **petals** (corolla). They protect the flower and attract pollinators but do not produce gametes.

(b)

| Self-Pollination | Cross-Pollination |

|---|---|

| Transfer of pollen from anther to stigma of the **same flower** | Transfer of pollen to the stigma of a **different flower** (same or different plant) |

| No pollinating agent required | Requires agents like wind, water, insects |

Significance of Pollination:

1. It enables fertilisation, leading to seed and fruit formation.
2. Cross-pollination introduces genetic variation, producing better-adapted offspring.

(c) After fertilisation:

- Each **ovule** develops into a **seed** (containing the embryo).
- The **ovary wall** develops into the **fruit** (pericarp) that encloses the seeds.

Source: Chapter 7 — How do Organisms Reproduce?

Explanation

- **(a)** Only 1 mark — one crisp line naming sepals and petals is sufficient.
- **(b)** This is the bulk of the marks (~3). A small table is neat and exam-friendly. Two significance points must be distinct. Avoid vague statements like "helps reproduction."
- **(c)** Examiners expect the specific fate of **both** ovule (→ seed) and ovary (→ fruit). Missing either halves the marks here.

Q82. § 7.3.2 Sexual Reproduction in Flowering Plants

[4]

Pollination is an important process in sexual reproduction of plants. It is an essential process that facilitates fertilisation in plants. Pollinating agents can be wind, water, insects and birds. Several changes take place in the flower after the fertilization has taken place.

Answer the following questions :

- (a) Write the main difference between self-pollination and cross-pollination. [1]
- (b) Name the part of the flower which attracts insects for pollination. What happens to this part after fertilisation ? [1]
- (c) Answer either (i) or (ii): [2]

Previously asked in: 2024 31/5/1 Q38

♦ How do Organisms Reproduce?

Pollination – agents and role of flower parts (petals) in attracting insects

Post-fertilisation changes in the flower

Self-pollination vs Cross-pollination

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I notice that sub-question (c) is incomplete — options (i) and (ii) are not provided. I will answer (a) and (b) fully, and note the gap for (c).

Model Answer

(a) In **self-pollination**, pollen is transferred from the anther to the stigma of the **same flower or same plant**. In **cross-pollination**, pollen is transferred from the anther of one flower to the stigma of a **different plant** of the same species.

(b) The **petals** (corolla) attract insects for pollination through their bright colours and fragrance. After fertilisation, the petals **wither and fall off**, as their role in attracting pollinators is complete.

(c) (Sub-question (c) cannot be answered as options (i) and (ii) were not provided in the question. Please include the missing options for a complete answer.)

Source: Life Processes / How do Organisms Reproduce, Sexual Reproduction in Plants

Explanation

- (a) The key distinction examiners look for is *same plant vs. different plant*. One crisp line is enough for 1 mark.
- (b) Two parts = two marks: name the part (petals) **and** state what happens after fertilisation (they wither/fall). Missing either half loses the mark.
- (c) Always check that all options of a choice-based sub-question are copied into your paper before the exam — here the options were cut off. In the actual exam, attempt whichever option you choose and write it clearly as (c)(i) or (c)(ii).

Q83. § 7.2.2 Fragmentation**[1]**

Select the option having correct matching of the organism given in Column I with the mode of reproduction in Column II :

Column I: P Leishmania, Q Spirogyra, R Planaria, S Plasmodium

Column II: 1. Regeneration, 2. Multiple Fission, 3. Binary Fission, 4. Fragmentation, 5. Budding

- (A) P-4, Q-2, R-1, S-3
- (B) P-3, Q-4, R-5, S-2
- (C) P-3, Q-4, R-1, S-2
- (D) P-4, Q-3, R-2, S-1

Previously asked in: 2025 31/6/1 Q10

♦ How do Organisms Reproduce?

Binary Fission in Leishmania

Fragmentation in Spirogyra

Modes of asexual reproduction – Binary Fission, Multiple Fission, Fragmentation, Regeneration, Budding

Multiple Fission in Plasmodium

Regeneration in Planaria

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Model Answer**(C) P-3, Q-4, R-1, S-2**

Leishmania – Binary Fission (3); Spirogyra – Fragmentation (4); Planaria – Regeneration (1); Plasmodium – Multiple Fission (2).

Explanation

- **Leishmania:** Binary fission in a definite orientation (it has a whip-like flagellum at one end).
- **Spirogyra:** Fragmentation – breaks into pieces upon maturation, each growing into a new individual.
- **Planaria:** Regeneration – a classic example; cut pieces regrow into whole organisms.
- **Plasmodium:** Multiple fission – divides into many daughter cells simultaneously (malarial parasite).

Examiners commonly set this type of matching MCQ; knowing *which* organism uses *which* specific mode is essential.

Q84. § Introduction § 7.2.2 Fragmentation § 7.2.3 Regeneration

Give reason for the following : All multicellular organisms cannot give rise to new individuals through fragmentation or regeneration.

Previously asked in: 2023 31/6/1 Q35 (c)

♦ How do Organisms Reproduce?

Fragmentation and Regeneration as modes of asexual reproduction

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Model Answer

Not all multicellular organisms can reproduce through fragmentation or regeneration because of their **complex body organisation**.

In simple multicellular organisms like Spirogyra or Planaria, the body organisation is relatively simple, so each fragment contains enough information and cell types to grow into a complete individual.

However, in complex multicellular organisms, specialised cells are organised into **tissues**, tissues into **organs**, and organs are placed at definite positions in the body. Such a carefully organised body cannot simply divide cell-by-cell into fragments, as each fragment would not have all the necessary tissues and organs to develop into a new individual.

Therefore, complex multicellular organisms require more specialised modes of reproduction involving specific reproductive cell types, rather than simple fragmentation or regeneration.

Source: Chapter 7, Sections 7.2.2 (Fragmentation) and 7.2.3 (Regeneration)

Explanation

- The examiner expects two key ideas: (1) simple multicellular organisms *can* do it because of simple organisation; (2) complex ones *cannot* because cells are specialised into tissues and organs in a definite arrangement.
- Mention **Spirogyra/Planaria** as examples of those that can, to show contrast.
- The phrase "not simply a random collection of cells" from the textbook is the core reasoning — paraphrase it clearly.
- Avoid writing vague answers like "they are complex"; explain *why* complexity is the barrier.

Q85. § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? § 7.1.1 The Importance of Variation**[2]**

Explain the mechanism of inheritance used by sexually reproducing organisms to ensure the stability of DNA of the species.

Previously asked in: 2025 31/6/1 Q23(b)

♦ **How do Organisms Reproduce?**

DNA copying and stability of species in sexual reproduction

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Model Answer

Sexually reproducing organisms use **DNA copying mechanisms** to maintain species stability. During reproduction, the DNA is copied using chemical reactions and passed to offspring. Although copying is not 100% accurate and small variations arise, the consistency of DNA copying ensures that body design features are preserved, maintaining stable populations suited to their ecological niche.

Explanation

The examiner expects two key points: (1) DNA copying ensures inheritance of body design features, and (2) the consistency (not perfection) of this copying maintains population stability. Avoid writing only about variation — the question focuses on *stability*. The phrase "consistency of DNA copying" directly from the chapter is important to include.

Source: Chapter 7, Section 7.1 and 7.1.1

Q86. § 7.2.2 Fragmentation § 7.2.4 Budding**[1]**

Identify the correct statement for spirogyra, leishmania and hydra :

- A they reproduce sexually.
- B they are unicellular.
- C they are multicellular.
- D they reproduce asexually.

Previously asked in: 2026 31/1/1 Q3

♦ **How do Organisms Reproduce?**

Asexual reproduction modes (fragmentation, fission, budding)

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Model Answer**Option D — they reproduce asexually.**

Spirogyra reproduces by fragmentation, Leishmania by binary fission, and Hydra by budding — all asexual methods. Also, Leishmania is unicellular while Spirogyra and Hydra are multicellular, so options B and C are incorrect.

Explanation

The question tests whether students can find the **one common trait** shared by all three organisms. Sexual reproduction is ruled out (all three examples in the chapter illustrate asexual reproduction). Options B and C are wrong because Leishmania is unicellular while Spirogyra and Hydra are multicellular. Option D is the only universally correct statement. Examiners award the mark for choosing D with a brief justification.

Q87. § 7.2.6 Spore Formation § 7.3 SEXUAL REPRODUCTION § 7.3.2 Sexual Reproduction in Flowering Plants

[2]

State two differences between pollination and fertilization.

Previously asked in: 2026 31/1/1 Q11(b)

♦ How do Organisms Reproduce?

Pollination vs Fertilization in flowering plants

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Model Answer

| Basis | Pollination | Fertilisation |

|---|---|---|

| Definition | Transfer of pollen grains from anther to stigma | Fusion of male germ-cell with female gamete (egg cell) in the ovule |

| Nature | External process; may involve agents like wind, water, or animals | Internal process occurring inside the ovary |

Explanation

Examiners expect two clear, contrasting points. The most scoring approach is a small table or two labelled points. Key distinction: pollination is *transfer* (external), fertilisation is *fusion* (internal). Avoid vague language — use textbook terms: anther, stigma, male germ-cell, ovule, zygote.

Source: Chapter 7, Section 7.3.2 — Sexual Reproduction in Flowering Plants

Q88. § 7.3.2 Sexual Reproduction in Flowering Plants

[5]

Answer the following :

- (i) Differentiate between self-pollination and cross-pollination. [2]
- (ii) Identify A, B and C in the diagram given below and write one function of each. [3]

Previously asked in: 2025 31/1/1 Q35(b)

♦ How do Organisms Reproduce?

Self-pollination vs Cross-pollination

Structure of a Flower – Parts and Functions

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Model Answer**(i) Self-Pollination vs Cross-Pollination:**

| Self-Pollination | Cross-Pollination |

| --- | --- |

| Transfer of pollen from anther to stigma of the **same flower** or same plant. | Transfer of pollen from anther to stigma of a **different flower** on a different plant of the same species. |

| No pollinating agent required. | Requires agents like wind, water, insects, etc. |

(ii) Identification of A, B, C (Longitudinal Section of a Flower):

Based on a standard diagram of a flower's reproductive parts:

- **A – Stigma:** It is the top part of the pistil. *Function:* It receives pollen grains during pollination (sticky surface traps pollen).
- **B – Style:** It is the elongated stalk connecting stigma to the ovary. *Function:* It provides a passage for the pollen tube to grow down towards the ovary.
- **C – Ovary:** It is the swollen base of the pistil containing ovules. *Function:* It contains ovules which, after fertilisation, develop into seeds; the ovary develops into fruit.

Explanation

- For **(i)**, examiners expect a clear point-by-point or tabular comparison — at least 2 differences for 2 marks.
- For **(ii)**, since the actual diagram is not visible, A/B/C are identified as the three standard parts of the pistil (stigma, style, ovary) — the most commonly labelled structure in CBSE Chapter 7 diagrams on sexual reproduction in plants. Each part must be named + one function stated for full marks (1 mark per part). If your diagram labels different structures (e.g., anther, filament, petal), apply the same format: name + one function each.

Q89. § 7.2.1 Fission § 7.2.2 Fragmentation § 7.2.6 Spore Formation

[1]

In which of the following organisms, multiple fission is a means of asexual reproduction ?

- (a) Yeast
- (b) Leishmania
- (c) Paramecium
- (d) Plasmodium

Previously asked in: 2024 31/1/1 Q16

♦ How do Organisms Reproduce?

Multiple Fission as Asexual Reproduction

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Model Answer

(d) Plasmodium

Plasmodium (the malarial parasite) divides into many daughter cells simultaneously through multiple fission.

Explanation

The passage explicitly states: "Other single-celled organisms, such as the malarial parasite, Plasmodium, divide into many daughter cells simultaneously by multiple fission." Yeast reproduces by budding; Leishmania and Amoeba undergo **binary** fission. Examiners expect students to distinguish between binary fission, multiple fission, and budding.

Q90. § 7.2.6 Spore Formation

[5]

Answer the following :

(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.

Previously asked in: 2023 31/5/1 Q35 (b)

♦ How do Organisms Reproduce?

Post-fertilisation changes in a flower

Regeneration in Planaria

Spore formation in Rhizopus (sporangia)

Vegetative propagation in Bryophyllum (leaf buds)

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Model Answer

(i)

(1) Leaves of Bryophyllum on soil: Buds present on the leaf margins develop into new plants. **Mode: Vegetative propagation.**

(2) Planaria cut into many pieces: Each piece regenerates and grows into a complete new organism. **Mode: Regeneration.**

(3) Rhizopus sporangia liberate spores: The spores germinate under favourable conditions of moisture and warmth to grow into new Rhizopus organisms. **Mode: Spore formation.**

(ii) Changes after fertilisation in a flower:

- The **zygote** develops into an **embryo**.
- **Ovules** develop into **seeds**.
- The **ovary** develops into a **fruit**.
- **Petals, sepals, stamens, style, and stigma** wither and fall off.
- The wall of the ovary becomes the **fruit wall (pericarp)**.

Source: Chapter 7 – How do Organisms Reproduce?, Sections 7.2 and 7.3

Explanation

- For part (i), examiners expect both: **what happens + name of the mode**. Naming the mode correctly fetches the mark.
- Bryophyllum = vegetative propagation (not budding); Planaria = regeneration; Rhizopus = spore formation — these three must not be confused.
- For part (ii), the key changes are ovule→seed, ovary→fruit, and the withering of other floral parts. These are standard board-exam points and must be listed clearly.

Q91. § 7.2.3 Regeneration

[4]

Asexual reproduction involves a single parent to produce offsprings without the formation of gametes. It occurs by the following ways : Fission, Budding, Fragmentation, Spore formation and Regeneration. In one of the methods like regeneration, Planaria A is cut horizontally into three pieces – L, M and N and Planaria B is cut vertically into two equal halves – O and P.

Read the source and answer the sub-parts that follow.

- (a) Which of the cut pieces of the two Planaria could regenerate to form a complete organism ? [1]
- (b) Give an example of another organism which follows the same mode of reproduction as Planaria. [1]
- (c) What is the meaning of 'development' in regeneration ? [2]

Previously asked in: 2024 31/2/1 Q38

♦ How do Organisms Reproduce?

Asexual reproduction – Fission, Budding, Fragmentation, Spore formation, Regeneration

Development and differentiation in regeneration

Regeneration as a mode of asexual reproduction

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Model Answer

- (a) All pieces of Planaria A (L, M, and N) and both halves of Planaria B (O and P) can regenerate into complete organisms, as Planaria has the ability to regenerate from any cut piece.
- (b) Hydra is another organism that follows the same mode of reproduction (regeneration) as Planaria.
- (c) 'Development' in regeneration means that the specialised cells present in the cut piece multiply and form a mass of cells. These cells then differentiate and develop into various cell types and tissues, gradually organising into a complete new organism with all its body parts.

Source: Chapter – How do Organisms Reproduce?, Section – Regeneration

Explanation

- (a) In Planaria, every cut piece can regenerate — examiners expect students to name all pieces (L, M, N, O, P).
- (b) Hydra is the standard textbook example alongside Planaria for regeneration.
- (c) The 2-mark answer must cover **two steps**: (i) cell multiplication forming a cell mass, and (ii) differentiation/development into a complete organism. Missing either step costs a mark.

Q92. § 7.3.2 Sexual Reproduction in Flowering Plants**[5]**

Answer the following based on the diagram given :

- (i) Identify the parts 'X' and 'Y' in the figure given below. [1]
- (ii) Name the yellowish coloured structures produced by the part labelled as 'Y'. [1]
- (iii) Write the name of the process by which these are transferred to the part labelled as 'X'. [1]
- (iv) Explain the process of seed formation in a flowering plant. [2]

Previously asked in: 2025 31/3/1 Q35(a)

♦ How do Organisms Reproduce?

Parts of a flower – Stamen (anther) and Pistil (stigma/carpel)

Pollen grains – yellowish structures produced by the anther

Pollination – transfer of pollen grains from anther to stigma

Seed formation / Double fertilisation in flowering plants

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Model Answer

(i) X – Stigma (female reproductive part / pistil)

Y – Anther (part of stamen / male reproductive part)

(ii) The yellowish coloured structures produced by part Y (anther) are **pollen grains**.

(iii) The process by which pollen grains are transferred from the anther (Y) to the stigma (X) is called **Pollination**.

(iv) After pollination, the pollen grain on the stigma grows a pollen tube which travels through the style to reach the ovary. The male germ-cell from the pollen fuses with the egg cell (female gamete) in the ovule — this is called **fertilisation**, forming a zygote.

The zygote divides several times to form an **embryo** inside the ovule. The ovule develops a tough coat and becomes a **seed**. The ovary grows and ripens to form a **fruit**. Under suitable conditions, the seed germinates and develops into a new plant.

Source: Chapter 7, Section 7.3.2 – Sexual Reproduction in Flowering Plants

Explanation

- For (i), from the diagram context and the passage: stamen produces pollen (yellow) → anther is part Y; stigma is the terminal sticky part of pistil → part X.
- For (ii), the passage explicitly states "it produces pollen grains that are yellowish in colour."
- For (iii), the term "pollination" is the exact term to use; mention self/cross only if marks demand it.
- For (iv) (2 marks ≈ 40–50 words): cover pollen tube growth → fertilisation → zygote → embryo → ovule becomes seed → ovary becomes fruit. These are the key sequential steps examiners look for. Do not omit "fertilisation" or "zygote" — they are scoring terms.

Q93. § 7.3.2 Sexual Reproduction in Flowering Plants § 7.3.3 (b) Female Reproductive System

[5]

Answer the following:

- (i) Study the diagram given below and name the parts marked as A, B and C. What happens when B reaches C in the ovary? Mention its significance.
- (ii) Write the post fertilisation changes that occur in a flower.

Previously asked in: 2024 31/3/1 Q35(b)

♦ How do Organisms Reproduce?

Pollination and pollen tube growth – parts of a flower (pollen grain, pollen tube, ovule)

Post-fertilisation changes in a flower

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Model Answer

(i)

- **A** – Style (part of pistil connecting stigma to ovary)
- **B** – Pollen tube (grows down the style carrying male gametes)
- **C** – Egg cell / Ovule (inside the ovary)

When B reaches C: The pollen tube enters the ovule through the micropyle and releases two male gametes. One fuses with the egg cell to form a **zygote** (fertilisation); the other fuses with the polar nuclei to form the **primary endosperm nucleus** (double fertilisation).

Significance: Fertilisation leads to the formation of a zygote, which develops into an embryo, ensuring sexual reproduction and the formation of seeds and new plants.

(ii) **Post-fertilisation changes in a flower:**

1. The **zygote** develops into an **embryo**.
2. The **ovule** develops into a **seed**.
3. The **ovary** develops into a **fruit**.
4. The **sepals, petals, stamens, and style** wither and fall off.
5. The wall of the ovary (pericarp) becomes the **fruit wall**.

Source: Chapter 7, Section 7.3 – How do Organisms Reproduce?

Explanation

- Part (i) is worth ~3 marks: name all three parts (1 mark), explain what happens at fertilisation including double fertilisation (1 mark), and state significance (1 mark).
- Part (ii) is worth ~2 marks: list at least 4–5 post-fertilisation changes concisely. Examiners expect: zygote→embryo, ovule→seed, ovary→fruit, and floral parts withering.
- "Double fertilisation" is a key term examiners reward — don't omit it.
- Keep post-fertilisation changes as a neat list; that format is clear and scores well.

Q94. § 7.3.3 (d) Reproductive Health

[5]

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 pregnancies.
- (ii) Name the surgical methods to prevent pregnancy.
- (iii) Give one example each of sexually transmitted diseases caused by bacteria and virus.

Previously asked in: 2026 31/2/1 Q16 (b)

◆ How do Organisms Reproduce?

Contraceptive methods – barrier, chemical, and hormonal (non-surgical)

Sexually transmitted diseases (STDs) – bacterial and viral examples

Surgical methods of contraception – vasectomy and tubectomy

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Model Answer**(i) Two non-surgical contraceptive methods Radha can use:**

1. **Mechanical barrier method** – Use of condom (on penis) or similar covering worn in the vagina, which prevents sperm from reaching the egg.
2. **Hormonal pills (oral pills)** – These change the hormonal balance of the body so that eggs are not released and fertilisation cannot occur.

(She could also use copper-T / loop placed in the uterus to prevent pregnancy.)

(ii) Surgical methods to prevent pregnancy:

- **Vasectomy** – The vas deferens in the male is blocked, preventing sperm transfer.
- **Tubectomy** – The fallopian tube in the female is blocked, preventing the egg from reaching the uterus.

In both cases, fertilisation does not take place.

(iii) Examples of sexually transmitted diseases (STDs):

- **Caused by bacteria:** Gonorrhoea / Syphilis
- **Caused by virus:** HIV-AIDS / Warts

Source: Chapter 7, Section 7.3.3(d)

Explanation

- For part (i), name two methods clearly – barrier (condom/vaginal covering), hormonal pills, or copper-T/loop are all valid; pick any two.
- For part (ii), examiners expect the specific names *vasectomy* and *tubectomy* along with a one-line explanation of each.
- For part (iii), the passage directly names gonorrhoea and syphilis (bacterial) and warts and HIV-AIDS (viral) – use these exact examples for full marks.
- Avoid writing more than needed; crisp, labelled points score well in 5-mark questions.

Q95. § 7.3.3 (b) Female Reproductive System § 7.3.3 (d) Reproductive Health

[5]

Answer the following about reproduction :

- (i) Name three techniques/devices used by human females to avoid pregnancy. Mention the side effects caused by each.
- (ii) What will happen if in a human female (a) fertilisation takes place, (b) an egg is not fertilised ?

Previously asked in: 2024 31/1/1 Q35(A)

♦ How do Organisms Reproduce?

Contraceptive methods in human females and their side effects

Events after fertilisation vs. non-fertilisation of egg in human females

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Model Answer

(i) Three contraceptive techniques and their side effects:

1. **Condoms** – Barrier method used by males/females. Side effect: slight reduction in sensitivity; may tear or fail if not used correctly.
2. **Oral pills** – Contain hormones that prevent egg release. Side effect: may cause nausea, irregular bleeding, or hormonal imbalance with long-term use.
3. **Copper-T (IUD)** – Placed in the uterus to prevent implantation. Side effect: may cause heavy bleeding, cramping, or uterine discomfort.

(ii)

(a) Fertilisation takes place: The fertilised egg (zygote) implants in the uterine wall. The uterus lining is maintained to nourish the developing embryo, and pregnancy begins. Menstruation does not occur.

(b) Egg is not fertilised: The egg and the thickened uterine lining (built up to receive a zygote) are shed. This shedding of the lining along with blood is called **menstruation**.

Source: Chapter 7 – Reproduction, Section 7.3 Sexual Reproduction

Explanation

- Part (i) is worth ~3 marks: name each method + one side effect each — exactly what is needed.
- Part (ii) is worth ~2 marks: one point each for (a) and (b). The key idea in (b) is **why** menstruation occurs — the uterus lining is shed because fertilisation did not happen.
- Examiners look for: correct name of method, a valid side effect (not vague), and the link between fertilisation/non-fertilisation and uterine lining behaviour.
- "Copper-T" and "oral pills" are the textbook terms — use them exactly.

Q96. § 7.3.3 (a) Male Reproductive System § 7.3.3 (b) Female Reproductive System

[5]

Answer the following :

- (i) Where are testes located in the human males and why ? State two functions 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 ?

Previously asked in: 2023 31/5/1 Q35 (a)

♦ How do Organisms Reproduce?

Fertilization and changes in the human female reproductive system

Location and functions of testes

Surgical methods of contraception (vasectomy and tubectomy)

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Model Answer

(i) Testes are located **outside the abdominal cavity** in a pouch called the **scrotum**, because sperm formation requires a temperature slightly **lower than body temperature**.

Two functions of testes:

1. Production of sperms (male germ cells).
2. Secretion of the male hormone **testosterone**.

(ii)

1. **If the egg is fertilised:** The zygote divides and forms an embryo, which implants in the thickened uterine lining. The lining is maintained to nourish the embryo; pregnancy continues for approximately nine months.
1. **If the egg is not fertilised:** The uterine lining breaks down and sheds along with blood vessels. This causes **menstruation**, which lasts for a few days.

(iii) In **males**, the **vas deferens** is blocked/cut surgically (vasectomy) to prevent sperm transfer. In **females**, the **fallopian tube** is blocked/cut surgically (tubectomy) to prevent the egg from reaching the uterus. In both cases, fertilisation cannot occur.

Source: Chapter 7 – How do Organisms Reproduce?, Section 7.3.3

Explanation

- **(i):** Examiners expect the reason for scrotal location (temperature) and both functions — sperm production AND testosterone secretion. Missing either costs marks.
- **(ii):** Two distinct scenarios must be addressed separately. Key terms: *zygote* → *embryo* → *implantation* for (1); *menstruation/shedding of uterine lining* for (2).
- **(iii):** Name the specific structure blocked in each sex and state the outcome (fertilisation prevented). "Vasectomy/Tubectomy" as terms are acceptable but not mandatory for CBSE Class 10.

Q97. § 8.2 HEREDITY § 8.2.4 Sex Determination

[1]

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)

Previously asked in: 2024 31/1/1 Q8

♦ Heredity

Sex Determination in Humans

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Model Answer

(b) (ii) and (iv)

Statement (ii) is correct — sex depends on what the child inherits from the father (X or Y chromosome).

Statement (iv) is correct — sex is determined at fertilisation when gametes fuse.

Source: Chapter 8, Section 8.2.4 Sex Determination

Explanation

- Statement (i) is **wrong**: all children inherit X from the mother, so the mother does not determine sex.
- Statement (iii) is **wrong**: the passage clearly states *half* the children will be boys and *half* will be girls — equal probability.
- Statements (ii) and (iv) are directly supported by the text: the father's gamete (X or Y) decides sex, and this is fixed at fertilisation.

Q98. § 8.2.4 Sex Determination

[4]

In some families, either rural or urban, females are tortured for giving birth to a female child. They do not seem to understand the scientific reason behind the birth of a boy or a girl. In fact the mother is not responsible for the sex of the child and it has been genetically proved that the sex of a newborn is determined by what the child inherits from the father.

Read the case carefully and answer the questions that follow.

- (a) State the basis on which the sex of a newborn baby is determined in humans. [1]
- (b) Why is the pair of sex chromosomes called a mismatched pair in males ? [1]
- (c) How is the original number of chromosomes present in the parents restored in the progeny ? [2]

Previously asked in: 2023 31/5/1 Q38

◆ Heredity

Restoration of chromosome number through sexual reproduction and fertilisation

Sex Determination in Humans

Sex chromosomes and mismatched pair in males (XY)

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Model Answer

- (a) The sex of a newborn is determined by the type of sex chromosome inherited from the father. If the child inherits an X chromosome from the father, it is a girl (XX); if it inherits a Y chromosome, it is a boy (XY).
- (b) In males, the two sex chromosomes are X and Y, which are not perfectly homologous — they differ in size and genetic content. Hence, they are called a mismatched pair.
- (c) During gamete formation (meiosis), the chromosome number is halved — each gamete carries only one set (haploid, n). When the male gamete (n) fuses with the female gamete (n) during fertilisation, the original diploid number ($2n$) is restored in the progeny.

Source: *Heredity and Evolution, Sex Determination / Chromosomes and Sex*

Explanation

- (a) Examiners want mention of the father's contribution (X or Y) and the resulting XX/XY combination.
- (b) Key phrase is "mismatched" — X and Y differ in size and gene content; one mark for stating this clearly.
- (c) This is a 2-mark answer: name **meiosis** (halving) + **fertilisation** (restoration). Both steps must be mentioned for full credit.

Q99. § 8.2.4 Sex Determination

[2]

Justify that the sex determination of a child is based on what they inherit from their father and not from their mother.

Previously asked in: 2022 31/3/1 Q6(b)

♦ Heredity

Sex Determination in Humans

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Model Answer

In humans, females have two X chromosomes (XX) and males have one X and one Y chromosome (XY). The mother can only pass on an X chromosome to every child. The father, however, can pass either X or Y. A child inheriting X from the father is a girl; inheriting Y makes a boy. Hence, the sex of the child is determined by the father.

Source: Chapter 8, Section 8.2.4 – Sex Determination

Explanation

The key logic examiners want: **mother is always XX → only X possible from her → father's contribution (X or Y) is the deciding factor.** State this clearly with the XX/XY notation. Two marks = two key points: (1) mother contributes only X, (2) father contributes either X or Y, determining the sex. Don't forget to mention which combination gives a girl (XX) and which gives a boy (XY).

Q100. § 8.2.4 Sex Determination

[1]

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

Previously asked in: 2024 31/4/1 Q10

♦ Heredity

Zygote formation and chromosome number in humans

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Model Answer**Option C – 46**

A human zygote is formed by fusion of a sperm (23 chromosomes) and an egg (23 chromosomes), giving the zygote **46 chromosomes**.

Explanation

Each human gamete (sperm/egg) is haploid — it carries 23 chromosomes. Fertilisation combines two gametes, restoring the diploid number of 46. Option A (23) is the gamete number; Option D (92) would be if a zygote fused again; Option B (44) is incorrect. Examiners expect you to recall that human body cells have 46 chromosomes, so the zygote must also have 46.

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