CBSE CLASS X

Science (086)

QUESTION PAPER

AI-generated question paper

Code: 0RI9VM **Questions: 34** **Maximum Marks: 59** **Generated: 2026-06-25 17:33**

SELECTIONS USED

Subject	Science
Lessons	7 How do Organisms Reproduce?
Level of understanding	Initial understanding
Question selection	Curated chapter coverage (~3 questions per section)
Model	claude-sonnet-4-6

Composition — Difficulty: 21 straightforward · 11 medium · 2 deep | Types: 14 Very short · 14 Short · 5 MCQ · 1 Long

Q1. straightforward · initial-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[1]**

Why does a change in the DNA of a cell lead to a change in the body design of an organism?

◆ **How do Organisms Reproduce?**

Q2. medium · initial-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[2]**

When variations arise in a new DNA copy during cell division, what are the two possible outcomes for the organism carrying that variation?

◆ **How do Organisms Reproduce?**

Q3. deep · initial-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[3]**

Variation during reproduction is described as beneficial to a species but not necessarily to an individual organism. Explain this distinction with a suitable example.

◆ **How do Organisms Reproduce?**

Q4. medium · initial-understanding · § 7.2 MODES OF REPRODUCTION USED BY SINGLE ORGANISMS **[3]**

Name the mode of asexual reproduction used by each of the following organisms and briefly describe how it works: (i) Yeast (ii) Amoeba (iii) Plasmodium (iv) Leishmania.

◆ **How do Organisms Reproduce?**

Q5. straightforward · initial-understanding · § 7.2.1 Fission **[1]**

Binary fission in Leishmania always occurs along a specific orientation, whereas in Amoeba it can occur in any plane. Give a reason for this difference.

◆ **How do Organisms Reproduce?**

Q6. straightforward · initial-understanding · § 7.2.2 Fragmentation **[1]**

What is fragmentation as a mode of reproduction? Name one organism that reproduces by this method.

◆ **How do Organisms Reproduce?**

Q7. medium | initial-understanding | § 7.2.2 Fragmentation **[2]**

Why can fragmentation work as a method of reproduction in Spirogyra but not in more complex multicellular organisms like humans?

◆ **How do Organisms Reproduce?**

Q8. straightforward | initial-understanding | § 7.2.3 Regeneration **[1]**

Organisms like Hydra and Planaria can regrow into complete individuals from cut pieces. What is this ability called, and what type of cells make it possible?

◆ **How do Organisms Reproduce?**

Q9. straightforward | initial-understanding | § 7.2.4 Budding **[1]**

In Hydra, where does a bud originate, and what happens to it once it is fully mature?

◆ **How do Organisms Reproduce?**

Q10. straightforward | initial-understanding | § 7.2.5 Vegetative Propagation **[1]**

Which of the following is NOT a feature of vegetative propagation in plants?
(A) Offspring can bear flowers and fruits earlier than seed-grown plants.
(B) It can propagate plants that have lost the ability to produce seeds.
(C) Offspring show greater genetic diversity than the parent plant.
(D) It does not require the involvement of reproductive organs such as flowers.

A Plants can bear flowers and fruits earlier than seed-grown plants.
B It allows propagation of plants that have lost the ability to produce seeds.
C It introduces greater genetic variation than sexual reproduction.
D All plants produced are genetically similar to the parent plant.

◆ **How do Organisms Reproduce?**

Q11. straightforward | initial-understanding | § 7.2.5 Vegetative Propagation **[1]**

In Bryophyllum, new plants develop from the margins of its leaves. Which part of the plant does this illustrate as being capable of vegetative propagation?

◆ **How do Organisms Reproduce?**

Q12. straightforward | initial-understanding | § 7.2.6 Spore Formation **[1]**

What is the function of the thick walls surrounding spores in organisms like Rhizopus?

◆ **How do Organisms Reproduce?**

Q13. medium | initial-understanding | § 7.3 SEXUAL REPRODUCTION **[2]**

Why must germ-cells contain only half the number of chromosomes found in normal body cells?

◆ **How do Organisms Reproduce?**

Q14. medium | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

Why does the sexual mode of reproduction generate more variation in a population compared to asexual reproduction?

◆ **How do Organisms Reproduce?**

Q15. medium | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

In sexual reproduction, each new generation would have twice the amount of DNA as the previous generation — unless a special process takes place. What is that process, and how does it solve this problem?

◆ **How do Organisms Reproduce?**

Q16. straightforward | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[1]**

Which of the following best explains why sexual reproduction is advantageous for the long-term survival of a species?
(A) It requires less energy than asexual reproduction.
(B) It produces offspring identical to the parent, ensuring stability.
(C) It creates new combinations of genetic variants, increasing the chances that some individuals survive environmental changes.
(D) It allows a single individual to produce many offspring very quickly.

A It requires less energy than asexual reproduction.
B It produces offspring identical to the parent, ensuring stability.
C It creates new combinations of variants, increasing the chances that some individuals survive environmental changes.
D It allows a single individual to produce many offspring quickly.

◆ **How do Organisms Reproduce?**

Q17. straightforward | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[1]**

How does the structure of a male gamete (sperm) differ from that of a female gamete (egg/ovum)?

◆ **How do Organisms Reproduce?**

Q18. straightforward | initial-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[1]**

Which part of the pistil receives the pollen grain during pollination?

◆ **How do Organisms Reproduce?**

Q19. straightforward | initial-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[2]**

What is the difference between self-pollination and cross-pollination?

◆ **How do Organisms Reproduce?**

Q20. medium | initial-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[3]**

After pollination occurs in a flower, what series of changes eventually leads to the formation of a seed and a fruit? Describe the steps in order.

◆ **How do Organisms Reproduce?**

Q21. straightforward | initial-understanding | § 7.3.3 Reproduction in Human Beings **[1]**

Why are the testes located outside the abdominal cavity in the scrotum?

◆ **How do Organisms Reproduce?**

Q22. straightforward | initial-understanding | § 7.3.3 Reproduction in Human Beings **[1]**

Which of the following correctly describes the path a sperm travels after being produced, until it exits the male body?
(A) Testes → Urethra → Vas deferens → Penis
(B) Testes → Vas deferens → Urethra → Penis
(C) Testes → Prostate gland → Vas deferens → Urethra
(D) Testes → Seminal vesicles → Vas deferens → Penis

A Testes → Urethra → Vas deferens → Penis
B Testes → Vas deferens → Urethra → Penis
C Testes → Prostate gland → Vas deferens → Urethra
D Testes → Seminal vesicles → Vas deferens → Penis

◆ **How do Organisms Reproduce?**

Q23. straightforward | initial-understanding | § 7.3.3 Reproduction in Human Beings **[2]**

Where in the female reproductive system does fertilisation normally take place? What is the immediate outcome after the egg is fertilised at that site?

◆ **How do Organisms Reproduce?**

Q24. medium | initial-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

What is the role of the placenta in the development of an embryo inside the uterus?

◆ **How do Organisms Reproduce?**

Q25. medium | initial-understanding | § 7.3.3 Reproduction in Human Beings **[2]**

Why does menstruation occur every month?

◆ **How do Organisms Reproduce?**

Q26. medium | initial-understanding | § 7.3.3 Reproduction in Human Beings **[1]**

Which of the following contraceptive methods works by preventing the release of eggs?
(A) Copper-T
(B) Condom
(C) Oral hormonal pills
(D) Surgical blocking of the fallopian tube

A Copper-T
B Condom
C Oral hormonal pills
D Surgical blocking of the fallopian tube

◆ **How do Organisms Reproduce?**

Q27. deep | initial-understanding | § 7.3.3 Reproduction in Human Beings **[5]**

Puberty marks the beginning of sexual maturation in human beings. Describe two physical changes that occur specifically in boys and two that occur specifically in girls during puberty. Why is this stage considered important for reproduction?

◆ **How do Organisms Reproduce?**

Q28. straightforward | initial-understanding | § 7.3.3 (a) Male Reproductive System **[1]**

Why are the testes located outside the abdominal cavity in the scrotum rather than inside the body?

◆ **How do Organisms Reproduce?**

Q29. straightforward | initial-understanding | § 7.3.3 (b) Female Reproductive System **[2]**

Name the structures, in order, that an egg passes through after it is released from the ovary until it reaches the site of fertilisation in the human female reproductive system.

◆ **How do Organisms Reproduce?**

Q30. medium | initial-understanding | § 7.3.3 (b) Female Reproductive System **[3]**

What is the role of the placenta in the development of an embryo inside the mother's body?

◆ **How do Organisms Reproduce?**

Q31. straightforward | initial-understanding | § 7.3.3 (c) What happens when the Egg is not Fertilised? **[1]**

What is shed from the uterus during menstruation, and why does it occur?

◆ **How do Organisms Reproduce?**

Q32. straightforward | initial-understanding | § 7.3.3 (d) Reproductive Health **[1]**

How does a condom help in preventing sexually transmitted infections?

◆ **How do Organisms Reproduce?**

Q33. straightforward | initial-understanding | § 7.3.3 (d) Reproductive Health **[1]**

Which of the following contraceptive methods works by preventing the release of eggs through hormonal changes?
(A) Copper-T
(B) Condom
(C) Oral contraceptive pills
(D) Surgical blocking of the fallopian tube

A Copper-T
B Condom
C Oral contraceptive pills
D Surgical blocking of the fallopian tube

◆ **How do Organisms Reproduce?**

Q34. straightforward | initial-understanding | § 7.3.3 (d) Reproductive Health **[1]**

If the vas deferens in a male is surgically blocked, why will fertilisation not occur?

◆ **How do Organisms Reproduce?**

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CBSE CLASS X

Science (086)

ANSWER KEY

AI-generated question paper

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Q1. straightforward · initial-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[1]**

Why does a change in the DNA of a cell lead to a change in the body design of an organism?

♦ How do Organisms Reproduce?

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Model Answer

DNA is the blueprint for making proteins. A change in DNA leads to different proteins being made, which ultimately results in an altered body design.

Source: Chapter 7, Section 7.1

Explanation

The examiner expects you to establish the **DNA → protein → body design** chain in one line. The key idea from the passage is: DNA directs protein synthesis; changed DNA = different proteins = changed body design. Avoid writing more than one sentence for a 1-mark question.

Q2. medium · initial-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[2]**

When variations arise in a new DNA copy during cell division, what are the two possible outcomes for the organism carrying that variation?

♦ How do Organisms Reproduce?

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Model Answer

When a variation arises in a new DNA copy during cell division, there are two possible outcomes:

1. **The cell dies** — if the variation is so drastic that the new DNA copy cannot work with the inherited cellular apparatus.
2. **The cell survives** — if the variation is minor, the cell continues to live, being subtly different from the original.

Source: Chapter 7, Section 7.1

Explanation

The examiner expects both outcomes stated clearly — death (drastic variation) and survival (minor variation). The key phrase "subtle difference" signals understanding that surviving variants are similar but not identical. Avoid over-explaining; one crisp line per outcome is enough for 2 marks.

Q3. deep initial-understanding § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[3]**

Variation during reproduction is described as beneficial to a species but not necessarily to an individual organism. Explain this distinction with a suitable example.

◆ How do Organisms Reproduce?

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Model Answer

Variation during reproduction is beneficial to a **species** because it improves the chances of survival when environmental conditions change. However, most individual organisms possessing a variation may not benefit from it — in fact, they may be at a disadvantage in existing conditions.

Example: In a population of bacteria living in temperate water, if global warming raises the water temperature, most bacteria will die. Only those few individuals with a heat-resistant variation will survive and reproduce. The variation harmed the species' current numbers but saved it from extinction — yet for the majority of individual bacteria, it provided no benefit.

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

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Explanation

- Examiners want **two clear sides**: benefit to species (survival of population over time) vs. no guaranteed benefit to individual.
- The **bacteria + global warming example** from the textbook is the expected one — use it directly.
- Key phrase to include: "survival of species over time."
- Don't write about DNA copying or modes of reproduction — stay focused on the variation distinction.

Q4. medium | initial-understanding | § 7.2 MODES OF REPRODUCTION USED BY SINGLE ORGANISMS **[3]**

Name the mode of asexual reproduction used by each of the following organisms and briefly describe how it works: (i) Yeast (ii) Amoeba (iii) Plasmodium (iv) Leishmania.

◆ How do Organisms Reproduce?

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Model Answer

(i) Yeast – Budding: A small outgrowth (bud) develops on the parent cell, grows, and eventually separates to become a new individual.

(ii) Amoeba – Binary Fission: The cell splits into two equal halves in any plane, each developing into a new Amoeba.

(iii) Plasmodium – Multiple Fission: The nucleus divides repeatedly, then the cell splits simultaneously into many daughter cells.

(iv) Leishmania – Binary Fission: It splits into two, but division occurs in a definite orientation relative to its whip-like structure (flagellum).

Source: Chapter 7, Section 7.2.1 Fission

Explanation

- The question has four parts, so address each organism separately with its **mode name** and a brief **mechanism** — that earns full marks.
- Note the key contrast: Amoeba divides in **any plane**; Leishmania divides in a **definite orientation** — examiners often look for this distinction.
- Plasmodium's **multiple fission** (many daughter cells at once) is what sets it apart from the binary fission of Amoeba/Leishmania.
- "Budding" in Yeast is a favourite MCQ/short-answer topic — don't confuse it with fission.

Q5. straightforward | initial-understanding | § 7.2.1 Fission **[1]**

Binary fission in Leishmania always occurs along a specific orientation, whereas in Amoeba it can occur in any plane. Give a reason for this difference.

◆ How do Organisms Reproduce?

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Model Answer

Leishmania has a whip-like structure (flagellum) at one end, so binary fission occurs in a definite orientation relative to it. Amoeba lacks such a fixed structure, so fission can occur in any plane.

Explanation

The examiner expects you to link the **presence of the flagellum** in Leishmania to its fixed orientation of division. The key contrast is organised body structure (Leishmania) vs. no such structure (Amoeba). One crisp sentence covering both organisms earns full marks. Source: Chapter 7, Section 7.2.1.

Q6. straightforward | initial-understanding | § 7.2.2 Fragmentation **[1]**

What is fragmentation as a mode of reproduction? Name one organism that reproduces by this method.

◆ How do Organisms Reproduce?

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Model Answer

Fragmentation is the breaking up of a mature organism into smaller pieces (fragments), each of which grows into a new individual. **Example: Spirogyra.**

Source: Chapter 7, Section 7.2.2 – Fragmentation

Explanation

The answer needs two parts: define fragmentation + give one example. Spirogyra is the textbook example given in this section. Examiners expect the keyword "breaks/fragments into pieces" and that each piece grows into a new individual. Do not confuse fragmentation with regeneration (Hydra/Planaria) — regeneration involves cut pieces regrowing, while fragmentation in Spirogyra occurs naturally upon maturation.

Q7. medium | initial-understanding | § 7.2.2 Fragmentation **[2]**

Why can fragmentation work as a method of reproduction in Spirogyra but not in more complex multicellular organisms like humans?

◆ How do Organisms Reproduce?

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Model Answer

Spirogyra has a simple body organisation with no specialised tissues or organs. When it breaks into fragments, each piece contains all the necessary cell types to grow into a new individual.

In humans, cells are highly specialised and organised into specific tissues and organs placed at definite positions in the body. Such complex organisation makes cell-by-cell division through fragmentation impractical.

Source: Chapter 7, Section 7.2.2 Fragmentation

Explanation

The key contrast examiners look for is:

- **Spirogyra** = simple body, no tissue/organ specialisation → fragments can grow independently.
- **Humans** = specialised cells → tissues → organs at fixed positions → fragmentation cannot recreate this complex organisation.

Avoid writing a long essay. Two focused points, one for each organism, is exactly what a 2-mark answer needs.

Q8. straightforward initial-understanding § 7.2.3 Regeneration **[1]**

Organisms like Hydra and Planaria can regrow into complete individuals from cut pieces. What is this ability called, and what type of cells make it possible?

◆ How do Organisms Reproduce?

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Model Answer

This ability is called **regeneration**. It is made possible by **specialised cells** that proliferate and differentiate to form various cell types and tissues.

Source: Chapter 7, Section 7.2.3 Regeneration

Explanation

For a 1-mark question, examiners expect two things in one line: the correct term (**regeneration**) and the type of cells (**specialised cells**). Don't confuse regeneration with reproduction — the passage explicitly states they are not the same. Both parts are needed for full credit.

Q9. straightforward initial-understanding § 7.2.4 Budding **[1]**

In Hydra, where does a bud originate, and what happens to it once it is fully mature?

◆ How do Organisms Reproduce?

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Model Answer

In Hydra, a bud originates as an outgrowth due to repeated cell division at one specific site. Once fully mature, the bud detaches from the parent body and becomes a new independent individual.

Source: Chapter 7, Section 7.2.4 Budding

Explanation

This is a direct textbook-based question. Examiners look for two key points: (1) the origin of the bud (outgrowth from repeated cell division at a specific site) and (2) what happens when it matures (detaches and becomes an independent individual). Both points together earn the 1 mark. Avoid vague language like "it grows" — use precise terms like "detach" and "independent individual."

Q10. straightforward | initial-understanding | § 7.2.5 Vegetative Propagation **[1]**

Which of the following is NOT a feature of vegetative propagation in plants?
(A) Offspring can bear flowers and fruits earlier than seed-grown plants.
(B) It can propagate plants that have lost the ability to produce seeds.
(C) Offspring show greater genetic diversity than the parent plant.
(D) It does not require the involvement of reproductive organs such as flowers.

A Plants can bear flowers and fruits earlier than seed-grown plants.
B It allows propagation of plants that have lost the ability to produce seeds.
C It introduces greater genetic variation than sexual reproduction.
D All plants produced are genetically similar to the parent plant.

◆ How do Organisms Reproduce?

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Model Answer

(C) It introduces greater genetic variation than sexual reproduction.

Vegetative propagation produces offspring genetically similar to the parent (clones). Greater genetic variation is a feature of sexual reproduction, NOT vegetative propagation.

Explanation

The passage explicitly states: "all plants produced are genetically similar enough to the parent plant to have all its characteristics." Options A, B, and D are all genuine features of vegetative propagation mentioned in the textbook. Only option C is incorrect — genetic diversity/variation is a feature of **sexual** reproduction, not vegetative propagation, making it the right answer to a "NOT a feature" question.

Q11. straightforward | initial-understanding | § 7.2.5 Vegetative Propagation **[1]**

In Bryophyllum, new plants develop from the margins of its leaves. Which part of the plant does this illustrate as being capable of vegetative propagation?

◆ How do Organisms Reproduce?

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Model Answer

This illustrates that **leaves** are capable of vegetative propagation, as buds produced at the leaf margins of Bryophyllum fall on soil and develop into new plants.

Source: Chapter 7, Section 7.2.5 Vegetative Propagation

Explanation

The question directly targets the Bryophyllum example from Activity 7.5/7.2.5. The key term examiners look for is **"leaves"** (or "leaf margins"). Mentioning that the buds fall on soil and grow into new plants adds completeness for a 1-mark answer and shows understanding, not just recall.

Q12. straightforward | initial-understanding | § 7.2.6 Spore Formation **[1]**

What is the function of the thick walls surrounding spores in organisms like Rhizopus?

◆ How do Organisms Reproduce?

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Model Answer

The thick walls of spores protect them from harsh conditions until they come into contact with a moist surface and can begin to grow.

Source: Chapter 7, Section 7.2.6 – Spore Formation

Explanation

The answer is directly from the passage: "The spores are covered by thick walls that protect them until they come into contact with another moist surface and can begin to grow." For 1 mark, state the protective function clearly in one line — no extra detail needed.

Q13. medium | initial-understanding | § 7.3 SEXUAL REPRODUCTION **[2]**

Why must germ-cells contain only half the number of chromosomes found in normal body cells?

◆ How do Organisms Reproduce?

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Model Answer

When two germ-cells (sperm and egg) fuse during fertilisation, the resulting zygote must have the normal chromosome number. If each germ-cell had the full number of chromosomes, the zygote would have double the normal number, which would be non-viable. Therefore, germ-cells contain only half the chromosomes so that their fusion restores the correct chromosome number in the offspring.

Source: Chapter 7, Reproduction

Explanation

The examiner wants you to show you understand the **logic of halving**: fertilisation = fusion of two cells, so each must contribute exactly half. Key terms to use: **germ-cells**, **fertilisation**, **zygote**, and **chromosome number**. Two marks = two linked points — (1) fusion doubles the count, (2) so halving beforehand keeps it normal. Avoid vague statements like "so reproduction works."

Q14. medium | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

Why does the sexual mode of reproduction generate more variation in a population compared to asexual reproduction?

◆ How do Organisms Reproduce?

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Model Answer

In asexual reproduction, a single individual produces offspring by copying its own DNA. Although DNA copying is not perfectly accurate and introduces small variations, this process is slow.

In sexual reproduction, DNA from **two different individuals** is combined. Each parent already carries different patterns of accumulated variations. Combining these creates **new combinations of variants**, producing greater diversity in each generation.

Since all variations come from living, surviving individuals, they are unlikely to be harmful. These new combinations help a species adapt better to changing environments, improving chances of survival.

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

Explanation

- Examiners look for **two key ideas**: (1) DNA copying introduces slow variations; (2) sexual reproduction *combines* DNA from two individuals, generating far greater variation faster.
- Mention that accumulated variations from both parents are already "tested" (non-lethal) — this is a scoring point many students miss.
- Avoid writing long paragraphs about meiosis or gametes; focus on the variation argument as asked.
- The phrase "new combinations of variants" directly mirrors the textbook language — use it.

Q15. medium | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

In sexual reproduction, each new generation would have twice the amount of DNA as the previous generation — unless a special process takes place. What is that process, and how does it solve this problem?

♦ How do Organisms Reproduce?

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Model Answer

The process is **meiosis** (a special type of cell division).

Problem: In sexual reproduction, two individuals combine their DNA to form a new individual. If each parent contributes a full set of chromosomes, the offspring would have twice the DNA of the parents, disrupting the cellular apparatus.

Solution: Special reproductive cells (germ-cells) are formed in specialised organs through meiosis, which halves the number of chromosomes and the amount of DNA. When two such germ-cells (gametes) combine during fertilisation, the normal chromosome number and DNA content are restored in the new generation.

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

Explanation

- The examiner expects you to **name meiosis**, state the **problem** (doubling of DNA each generation), and explain the **solution** (halving via meiosis in germ-cells, restoration at fertilisation). These are three distinct points matching the 3 marks.
- Don't confuse meiosis with mitosis — meiosis specifically halves the chromosome number; mitosis keeps it the same.
- Key terms to use: *meiosis*, *germ-cells*, *gametes*, *chromosomes*, *fertilisation* — these signal to the examiner you know the concept precisely.

Q16. straightforward | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[1]**

Which of the following best explains why sexual reproduction is advantageous for the long-term survival of a species?
(A) It requires less energy than asexual reproduction.
(B) It produces offspring identical to the parent, ensuring stability.
(C) It creates new combinations of genetic variants, increasing the chances that some individuals survive environmental changes.
(D) It allows a single individual to produce many offspring very quickly.

A It requires less energy than asexual reproduction.
B It produces offspring identical to the parent, ensuring stability.
C It creates new combinations of variants, increasing the chances that some individuals survive environmental changes.
D It allows a single individual to produce many offspring quickly.

♦ How do Organisms Reproduce?

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Model Answer

(C) It creates new combinations of genetic variants, increasing the chances that some individuals survive environmental changes.

Explanation

The passage in section 7.1.1 directly states that variation is useful for the survival of species over time — if a niche changes drastically, individuals with variations have a chance to survive. Modes of sexual reproduction allow greater variation to be generated (from "What you have learnt"). Options A and D describe advantages of **asexual** reproduction; Option B describes asexual reproduction (identical offspring). Always link sexual reproduction → variation → survival in changing environments.

Q17. straightforward | initial-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[1]**

How does the structure of a male gamete (sperm) differ from that of a female gamete (egg/ovum)?

♦ How do Organisms Reproduce?

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Model Answer

The sperm (male gamete) is tiny, contains mainly genetic material, and has a long tail for movement. The egg (female gamete) is large, immobile, and contains no tail.

Source: Chapter 7, Section 7.3.3(a) & (b)

Explanation

The key contrast examiners expect is: **size** (sperm = tiny; egg = large), **mobility** (sperm has a tail and can move; egg is immobile), and **composition** (sperm = mostly genetic material; egg = larger cytoplasm). Even for 1 mark, mentioning at least one clear structural difference with both gametes named is essential.

Q18. straightforward | initial-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[1]**

Which part of the pistil receives the pollen grain during pollination?

◆ How do Organisms Reproduce?

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Model Answer

The **stigma** (the terminal, sticky part of the pistil) receives the pollen grain during pollination.

Source: Sexual Reproduction in Flowering Plants, chapter 7, section 7.3.2

Explanation

The pistil has three parts: ovary, style, and stigma. The stigma is the topmost, sticky part designed to trap pollen grains — this is the key term examiners expect. Don't write "ovary" (where fertilisation occurs later) or "style" (the passage tube). One word — *stigma* — earns the mark.

Q19. straightforward | initial-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[2]**

What is the difference between self-pollination and cross-pollination?

◆ How do Organisms Reproduce?

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Model Answer

Self-pollination: When pollen grains are transferred from the anther to the stigma of the *same flower*, it is called self-pollination.

Cross-pollination: When pollen grains are transferred from the anther of one flower to the stigma of *another flower*, it is called cross-pollination. This transfer is achieved by agents like wind, water, or animals.

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

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Explanation

- The textbook gives a direct, one-sentence definition for each term — reproduce those definitions precisely.
- The key distinguishing word is **same flower** (self) vs. **another flower** (cross). Examiners look for this contrast.
- Mentioning agents (wind, water, animals) for cross-pollination adds the extra detail expected in a 2-mark answer.
- No diagram is needed for this question type.

Q20. medium | initial-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[3]**

After pollination occurs in a flower, what series of changes eventually leads to the formation of a seed and a fruit? Describe the steps in order.

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Model Answer

After pollination, the pollen grain lands on the stigma and a pollen tube grows through the style to reach the ovary. Here, the male germ-cell fuses with the egg cell in the ovule — this is **fertilisation**, forming a **zygote**.

The zygote divides repeatedly to form an **embryo** inside the ovule. The ovule develops a tough coat and becomes the **seed**. Simultaneously, the ovary grows and ripens to form the **fruit**. The petals, sepals, stamens, style, and stigma shrivel and fall off.

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

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Explanation

Examiners look for the correct **sequence**: pollination → pollen tube growth → fertilisation → zygote → embryo (inside ovule) → seed (ovule with tough coat) → fruit (ripened ovary). Three marks typically map to three key stages, so naming and briefly describing each step (pollen tube, fertilisation, seed/fruit formation) earns full marks. Avoid vague language — use terms like *zygote*, *embryo*, *ovule*, and *ovary* precisely.

Q21. straightforward | initial-understanding | § 7.3.3 Reproduction in Human Beings **[1]**

Why are the testes located outside the abdominal cavity in the scrotum?

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Model Answer

Testes are located in the scrotum outside the abdominal cavity because sperm formation requires a lower temperature than the normal body temperature.

Explanation

This is a direct one-line fact from the textbook. Examiners expect the key phrase **"lower temperature than normal body temperature"** — without it, you will lose the mark. No extra detail is needed for 1 mark.

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

Q22. straightforward | initial-understanding | § 7.3.3 Reproduction in Human Beings **[1]**

Which of the following correctly describes the path a sperm travels after being produced, until it exits the male body?
(A) Testes → Urethra → Vas deferens → Penis
(B) Testes → Vas deferens → Urethra → Penis
(C) Testes → Prostate gland → Vas deferens → Urethra
(D) Testes → Seminal vesicles → Vas deferens → Penis

A Testes → Urethra → Vas deferens → Penis
B Testes → Vas deferens → Urethra → Penis
C Testes → Prostate gland → Vas deferens → Urethra
D Testes → Seminal vesicles → Vas deferens → Penis

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Model Answer

(B) Testes → Vas deferens → Urethra → Penis

Explanation

The passage states sperms are delivered through the **vas deferens**, which unites with the tube from the urinary bladder to form the **urethra** (common passage for sperms and urine), exiting through the **penis**. Prostate and seminal vesicles add secretions *along* the vas deferens path but are not stops in the sperm's route.

Q23. straightforward | initial-understanding | § 7.3.3 Reproduction in Human Beings **[2]**

Where in the female reproductive system does fertilisation normally take place? What is the immediate outcome after the egg is fertilised at that site?

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Model Answer

Fertilisation normally takes place in the **oviduct (fallopian tube)**.

After the egg is fertilised there, it becomes a **zygote**, which immediately starts dividing to form a ball of cells called an **embryo**. This embryo then travels to the uterus and gets implanted in its lining.

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

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Explanation

- Examiners expect two clear points for 2 marks: **(1) site = oviduct/fallopian tube** and **(2) immediate outcome = zygote formation → cell division → embryo**.
- A common mistake is saying fertilisation occurs in the uterus — it does **not**; implantation does.
- The word "immediate" outcome means zygote/cell division, not implantation (that comes later). Mention both zygote and division to be safe.

Q24. medium | initial-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

What is the role of the placenta in the development of an embryo inside the uterus?

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Model Answer

The placenta is a special disc-like tissue embedded in the uterine wall that connects the embryo to the mother. It has **villi** on the embryo's side, surrounded by **blood spaces** on the mother's side, providing a large surface area for exchange.

Its roles are:

1. **Nutrition:** Glucose and oxygen pass from the mother's blood to the embryo through the placenta.
2. **Waste removal:** Waste substances produced by the embryo are transferred into the mother's blood through the placenta for elimination.

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

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Explanation

Examiners expect three clear functional points for 3 marks:

- **Structure** of placenta (disc embedded in uterine wall, villi, blood spaces) — sets context.
- **Nutrient/gas transfer** (glucose + oxygen from mother to embryo).
- **Waste removal** (embryo's waste transferred to mother's blood).

Avoid vague statements like "it helps the baby grow." Use correct terms: *villi*, *blood spaces*, *uterine wall*. These specific terms earn marks. The answer should be concise — around 70–80 words is ideal for 3 marks.

Q25. medium | initial-understanding | § 7.3.3 Reproduction in Human Beings **[2]**

Why does menstruation occur every month?

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Model Answer

Menstruation occurs every month because the ovary releases one egg every month, and the uterus prepares itself by thickening its lining with blood and mucous to nourish a possible embryo. If the egg is not fertilised, this lining is no longer needed, so it breaks down and comes out through the vagina as blood and mucous — a process called menstruation.

Source: Chapter 7, Section 7.3.3(c)

Explanation

The examiner expects two linked points: (1) the monthly release of an egg causes the uterine lining to thicken, and (2) when fertilisation does not occur, that lining sheds as menstruation. Always mention both the **cause** (unfertilised egg) and the **effect** (shedding of uterine lining) to secure both marks.

Q26. medium | initial-understanding | § 7.3.3 Reproduction in Human Beings **[1]**

Which of the following contraceptive methods works by preventing the release of eggs?
(A) Copper-T
(B) Condom
(C) Oral hormonal pills
(D) Surgical blocking of the fallopian tube

A Copper-T
B Condom
C Oral hormonal pills
D Surgical blocking of the fallopian tube

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Model Answer

(C) Oral hormonal pills

Oral hormonal pills work by changing the hormonal balance of the body so that eggs are not released and fertilisation cannot occur.

Explanation

The passage explicitly states that one category of contraceptives "acts by changing the hormonal balance of the body so that eggs are not released." This directly matches oral hormonal pills. Copper-T prevents implantation, condoms act as a mechanical barrier, and surgical blocking of fallopian tubes prevents the egg from reaching the uterus — none of these prevent egg release.

Q27. deep | initial-understanding | § 7.3.3 Reproduction in Human Beings **[5]**

Puberty marks the beginning of sexual maturation in human beings. Describe two physical changes that occur specifically in boys and two that occur specifically in girls during puberty. Why is this stage considered important for reproduction?

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Model Answer

Physical changes in boys during puberty:

1. New thick hair growth appears on the face (moustache and beard).
2. The penis occasionally becomes enlarged and erect; voice begins to crack.

Physical changes in girls during puberty:

1. Breast size begins to increase, with darkening of the skin of the nipples.
2. Girls begin to menstruate (onset of menstrual cycle).

Importance of puberty for reproduction:

Puberty is important because reproductive tissues mature during this stage, enabling the body to produce germ-cells (sperms in males, eggs in females). As general body growth slows, the body directs resources toward sexual maturation. Changes like erection of the penis (needed for transfer of sperms) and development of breasts and uterus (needed for carrying and feeding the baby) prepare the body for the complete reproductive process.

Source: Chapter 7, Section 7.3.3

Explanation

- The question asks for **two specific to boys** and **two specific to girls** — examiners will deduct marks if you list common changes (hair in armpits, pimples) here.
- The "why important" part needs to connect puberty → maturation of reproductive tissues → ability to produce germ-cells and carry out reproduction. Don't just say "the body matures."
- With 5 marks, budget roughly: 1 mark each for the four changes + 1 mark for the explanation of importance.
- Avoid listing voice cracking AND facial hair as two separate boy-specific points if pressed for space; combine them or pick the two strongest examples.

Q28. straightforward | initial-understanding | § 7.3.3 (a) Male Reproductive System **[1]**

Why are the testes located outside the abdominal cavity in the scrotum rather than inside the body?

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Model Answer

Testes are located in the scrotum because **sperm formation requires a lower temperature than the normal body temperature**.

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

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Explanation

This is a direct one-line fact from the textbook. Examiners expect the key phrase "lower temperature than normal body temperature." Do not add extra details about testosterone or vas deferens — this is only 1 mark.

Q29. straightforward | initial-understanding | § 7.3.3 (b) Female Reproductive System **[2]**

Name the structures, in order, that an egg passes through after it is released from the ovary until it reaches the site of fertilisation in the human female reproductive system.

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Model Answer

After release from the ovary, the egg passes through the following structures in order:

1. **Fallopian tube (oviduct)** — carries the egg from the ovary towards the uterus; this is also the **site of fertilisation**.

The egg travels: **Ovary → Fallopian tube (oviduct)** — where fertilisation by sperm occurs.

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

Explanation

The question asks only up to the **site of fertilisation**, which is the fallopian tube/oviduct — so the uterus, cervix, and vagina are not required here. Examiners expect you to name the structures **in order** and identify the fallopian tube as the site of fertilisation. Mentioning both names (fallopian tube / oviduct) is good practice and shows complete knowledge. The 2 marks are typically split: 1 mark for naming the structure(s) in correct order, 1 mark for identifying the site of fertilisation.

Q30. medium | initial-understanding | § 7.3.3 (b) Female Reproductive System **[3]**

What is the role of the placenta in the development of an embryo inside the mother's body?

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Model Answer

The placenta is a special disc-shaped tissue embedded in the uterine wall. It plays the following roles:

1. **Nutrition:** It transfers glucose and oxygen from the mother's blood to the embryo through villi, which provide a large surface area for exchange.
2. **Waste removal:** Waste substances produced by the developing embryo are transferred into the mother's blood through the placenta for elimination.
3. **Connection:** It connects the embryo to the uterine wall, allowing the embryo to receive all necessary nourishment from the mother throughout the approximately nine months of development.

Source: Chapter 7, Section 7.3.3(b)

Explanation

Examiners expect three distinct functions for 3 marks — typically: (1) nutrient/gas transfer, (2) waste removal, and (3) the structural role connecting embryo to uterus. Mention **villi** and **blood spaces** to show textbook accuracy. Avoid writing a vague one-liner like "it provides nutrition" — split the functions clearly. The approximate 3-point structure maps directly to the 3 marks awarded.

Q31. straightforward | initial-understanding | § 7.3.3 (c) What happens when the Egg is not Fertilised? **[1]**

What is shed from the uterus during menstruation, and why does it occur?

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Model Answer

The thick, spongy lining of the uterus is shed as blood and mucus during menstruation because the egg is not fertilised and the lining is no longer needed.

Source: Chapter 7, Section 7.3.3(c)

Explanation

The answer must include **two parts**: what is shed (uterine lining/blood and mucus) and **why** (egg not fertilised, so the prepared lining breaks down). Examiners expect both for the 1 mark.

Q32. straightforward | initial-understanding | § 7.3.3 (d) Reproductive Health **[1]**

How does a condom help in preventing sexually transmitted infections?

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Model Answer

A condom acts as a mechanical barrier covering the penis, thereby preventing direct contact between body fluids during sex and thus blocking the transmission of many sexually transmitted infections like gonorrhoea, syphilis, and HIV-AIDS.

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

Explanation

The key point examiners look for is the **mechanism** (physical/mechanical barrier) and the **outcome** (prevents transmission of STIs). Naming one or two example infections (gonorrhoea, HIV-AIDS) strengthens the answer but is not strictly required for 1 mark. Do not confuse this with the contraceptive function — the question is specifically about STI prevention.

Q33. straightforward | initial-understanding | § 7.3.3 (d) Reproductive Health **[1]**

Which of the following contraceptive methods works by preventing the release of eggs through hormonal changes?
(A) Copper-T
(B) Condom
(C) Oral contraceptive pills
(D) Surgical blocking of the fallopian tube

A Copper-T
B Condom
C Oral contraceptive pills
D Surgical blocking of the fallopian tube

◆ How do Organisms Reproduce?

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Model Answer

(C) Oral contraceptive pills

Oral contraceptive pills work by changing the hormonal balance of the body so that eggs are not released, thus preventing fertilisation.

Explanation

The passage clearly states that one category of contraceptives "acts by changing the hormonal balance of the body so that eggs are not released." These drugs are "commonly taken orally as pills." Copper-T works by irritating the uterus; condom is a mechanical barrier; surgical blocking of fallopian tube prevents the egg from reaching the uterus — none of these involve hormonal changes to stop egg release.

Q34. straightforward | initial-understanding | § 7.3.3 (d) Reproductive Health **[1]**

If the vas deferens in a male is surgically blocked, why will fertilisation not occur?

◆ How do Organisms Reproduce?

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Model Answer

If the vas deferens is blocked, sperms cannot be transferred to the female reproductive tract, so they cannot reach the egg and fertilisation will not occur.

Source: Chapter 7, Section 7.3.3(d)

Explanation

The examiner wants you to directly link the function of the vas deferens (sperm transport) to the consequence of its blockage (no fertilisation). One clear causal sentence is enough for 1 mark. The textbook explicitly states: "If the vas deferens in the male is blocked, sperm transfer will be prevented... fertilisation will not take place."

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