CBSE CLASS X

Science (086)

QUESTION PAPER

AI-generated question paper

Code: 5ZWT3K **Questions: 75** **Maximum Marks: 211** **Generated: 2026-06-25 17:41**

SELECTIONS USED

Subject	Science
Lessons	7 How do Organisms Reproduce?
Level of understanding	Thorough understanding
Question selection	Curated chapter coverage (~5 questions per section + 8 synthesis)
Model	claude-sonnet-4-6

Composition — Difficulty: 2 straightforward · 43 medium · 30 deep | Types: 59 Short · 8 MCQ · 7 Long · 1 Very short

Q1. medium · thorough-understanding · § Introduction **[3]**

DNA in the cell nucleus controls the production of proteins, and proteins determine body design. Using this chain of logic, explain why even a small error during DNA copying could affect the characteristics of an offspring.

◆ **How do Organisms Reproduce?**

Q2. deep · thorough-understanding · § Introduction **[3]**

Variations arising during reproduction are essential for species survival, yet the same variations could be harmful to an individual organism. Justify this apparently contradictory statement with a suitable example.

◆ **How do Organisms Reproduce?**

Q3. medium · thorough-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[2]**

A newly formed DNA copy contains an error in the sequence of its nucleotides. What are the two possible outcomes for the cell that inherits this copy?

◆ **How do Organisms Reproduce?**

Q4. medium · thorough-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[3]**

Why must DNA copying always be accompanied by the creation of additional cellular apparatus during cell division?

◆ **How do Organisms Reproduce?**

Q5. deep · thorough-understanding · § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[5]**

A scientist argues that if DNA copying were made perfectly accurate, it would actually be harmful to species in the long run. Do you agree? Justify your answer with reference to the role of variation in species survival.

◆ **How do Organisms Reproduce?**

Q6. medium | thorough-understanding | § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[1]**

In a population of organisms occupying a stable niche, which of the following best explains why some variation among individuals is still beneficial?
(A) Variation allows natural selection to favour faster-reproducing individuals, stabilising the population size.
(B) Variation ensures that if the niche changes unexpectedly, at least some individuals may survive the new conditions.
(C) Variation reduces the frequency of DNA copying errors in subsequent generations.
(D) Variation enables every individual to adapt to multiple niches simultaneously, increasing overall survival.

A Variation allows organisms to reproduce faster and outcompete others in the same niche.
B Variation ensures that if the niche changes unexpectedly, at least some individuals may survive.
C Variation improves the accuracy of DNA copying in the next generation.
D Variation prevents overcrowding by causing some individuals to move to different niches.

◆ **How do Organisms Reproduce?**

Q7. deep | thorough-understanding | § 7.1 DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES? **[3]**

Variation arising from DNA copying errors is described as beneficial to the species but not necessarily to the individual organism. Explain this distinction using a specific example.

◆ **How do Organisms Reproduce?**

Q8. medium | thorough-understanding | § 7.1.1 The Importance of Variation **[3]**

A population of frogs lives in a pond that remains cool throughout the year. Due to climate change, the pond's temperature rises sharply over a few years and most frogs die. However, a small number survive and eventually repopulate the pond. What does this scenario reveal about the relationship between variation and the survival of a species?

◆ **How do Organisms Reproduce?**

Q9. deep | thorough-understanding | § 7.1.1 The Importance of Variation **[3]**

Variation arising from DNA copying errors is beneficial for a species but can be harmful to an individual organism. Explain why this apparent contradiction exists.

◆ **How do Organisms Reproduce?**

Q10. medium | thorough-understanding | § 7.1.1 The Importance of Variation **[1]**

[mcq] A forest contains two populations of beetles — Population X, in which all individuals are identical, and Population Y, which shows considerable variation in body colour and heat tolerance. If a sudden drought raises the forest temperature significantly, which of the following most accurately predicts the outcome and explains why?
(A) Population X will survive better because all its members share the same successful traits.
(B) Population Y will survive better because some individuals may already possess traits suited to the new conditions.
(C) Both populations will be equally affected because survival depends only on population size.
(D) Population X will survive better because identical DNA is copied with fewer errors during reproduction.

A Organisms without variation reproduce more slowly, reducing population size over time.
B If the environment changes, no individual in the population would have traits suited to the new conditions.
C A uniform population consumes resources faster and is more likely to face starvation.
D Without variation, organisms cannot carry out DNA copying and reproduction stops entirely.

◆ **How do Organisms Reproduce?**

Q11. deep | thorough-understanding | § 7.2 MODES OF REPRODUCTION USED BY SINGLE ORGANISMS **[3]**

Spirogyra reproduces by fragmentation, while Rhizopus reproduces by spore formation. (a) What is the key advantage spore formation has over fragmentation when environmental conditions become unfavourable? (b) Why can neither of these asexual methods work effectively for reproduction in complex multicellular animals?

◆ **How do Organisms Reproduce?**

Q12. deep thorough-understanding § 7.2.1 Fission **[3]**

Amoeba divides in any plane, but Leishmania always divides along a fixed orientation relative to its whip-like structure. What does this difference reveal about the relationship between a cell's structural complexity and the way it undergoes binary fission?

◆ **How do Organisms Reproduce?**

Q13. medium thorough-understanding § 7.2.1 Fission **[3]**

Plasmodium, the parasite that causes malaria, does not reproduce by simply splitting into two inside the human host. (i) Name the mode of asexual reproduction it uses and describe how it differs from binary fission. (ii) Explain why this mode of reproduction is better suited to Plasmodium's survival strategy inside a host compared to binary fission.

◆ **How do Organisms Reproduce?**

Q14. medium thorough-understanding § 7.2.2 Fragmentation **[3]**

Spirogyra reproduces by fragmentation, but a complex animal like a frog cannot. What is the fundamental difference in body organisation between these two organisms that makes fragmentation a viable reproductive strategy for one but not the other?

◆ **How do Organisms Reproduce?**

Q15. medium thorough-understanding § 7.2.2 Fragmentation **[3]**

Both fragmentation and regeneration can result in new individuals arising from parts of an existing organism. Explain the key difference between these two processes, giving one example of each.

◆ **How do Organisms Reproduce?**

Q16. medium thorough-understanding § 7.2.2 Fragmentation **[1]**

Which of the following best explains why Spirogyra, a multicellular organism, can reproduce by fragmentation while most other multicellular organisms cannot?
(A) Spirogyra reproduces faster than other multicellular organisms.
(B) Each cell of Spirogyra is undifferentiated and capable of independent survival and growth.
(C) Spirogyra lives in water, which provides the physical force needed to break it apart.
(D) Spirogyra lacks a nucleus, so its cells can divide without any signal.

A Spirogyra produces spores that can survive harsh conditions.
B Spirogyra lacks specialised tissues and organs, so any fragment contains all it needs to grow into a new individual.
C Spirogyra undergoes meiosis before breaking into fragments, ensuring each piece has the correct chromosome number.
D Spirogyra fragments only release germ-cells, which then develop into new filaments.

◆ **How do Organisms Reproduce?**

Q17. deep thorough-understanding § 7.2.2 Fragmentation **[5]**

Fragmentation is classified as a form of asexual reproduction. Using this as a starting point, analyse what this tells us about the genetic relationship between the fragments produced by a single Spirogyra filament, and discuss one consequence this might have for the survival of the population if environmental conditions change drastically.

◆ **How do Organisms Reproduce?**

Q18. deep thorough-understanding § 7.2.3 Regeneration **[3]**

Hydra and Planaria can regenerate into complete organisms from cut pieces, yet regeneration is not classified as a mode of reproduction. Justify this statement with appropriate reasoning.

◆ **How do Organisms Reproduce?**

Q19. medium | thorough-understanding | § 7.2.4 Budding **[3]**

Both budding in Hydra and regeneration in Planaria involve the proliferation and differentiation of cells to produce new body parts. Distinguish between the two processes and explain why budding is considered a mode of reproduction while regeneration serves a different primary biological purpose. Also describe, step by step, how budding in Hydra leads to the formation of a new independent individual.

◆ How do Organisms Reproduce?

Q20. medium | thorough-understanding | § 7.2.5 Vegetative Propagation **[3]**

A farmer wants to grow a variety of rose that produces exceptionally fragrant flowers. He knows that seeds from this rose may not reliably produce plants with the same fragrance. Which method of propagation should he use, and why would it better guarantee the desired trait in the new plants?

◆ How do Organisms Reproduce?

Q21. medium | thorough-understanding | § 7.2.5 Vegetative Propagation **[1]**

[mcq] Banana plants and seedless oranges do not produce viable seeds. What does this imply about how new plants of these varieties must be obtained, and which of the following best explains why?
(A) They reproduce by spore formation since seeds are absent
(B) They must be propagated vegetatively because no seeds are available for sexual reproduction
(C) They can only reproduce through pollination by a different species
(D) They undergo regeneration from any injured body part automatically

A Their seeds are too small to germinate under natural conditions.
B They have lost the capacity to produce seeds.
C Their seeds produce plants with inferior characteristics.
D Vegetative propagation is faster, so seeds are never used for these plants.

◆ How do Organisms Reproduce?

Q22. medium | thorough-understanding | § 7.2.5 Vegetative Propagation **[3]**

In Bryophyllum, new plants arise from buds along the margins of leaves, while in potato, new plants arise from buds present in notches on the tuber. What do both these examples reveal about the fundamental requirement for vegetative propagation to succeed in a plant part?

◆ How do Organisms Reproduce?

Q23. medium | thorough-understanding | § 7.2.5 Vegetative Propagation **[2]**

A plant produced from seed takes several years to flower for the first time, while a plant of the same species grown by vegetative propagation flowers within a year. What explains this difference?

◆ How do Organisms Reproduce?

Q24. deep | thorough-understanding | § 7.2.5 Vegetative Propagation **[5]**

[long_answer] Vegetative propagation is classified as a form of asexual reproduction in plants. Justify this classification by explaining what vegetative propagation shares with other asexual modes of reproduction in terms of cell division and genetic outcome. Then identify one significant consequence this has for the genetic diversity of a crop grown entirely by this method, and explain whether this consequence is always a disadvantage for the farmer.

◆ How do Organisms Reproduce?

Q25. deep | thorough-understanding | § 7.2.5 Vegetative Propagation **[2]**

[short_answer] In tissue culture, new plants are regenerated from a few cells taken from the growing tip of a parent plant. Explain why every plant produced by this technique is genetically identical to the parent, and state what property of plant cells makes this technique possible.

◆ How do Organisms Reproduce?

Q26. medium | thorough-understanding | § 7.2.6 Spore Formation **[3]**

Rhizopus reproduces by spore formation under unfavourable conditions. Explain how the structural features of spores make this mode of reproduction more effective for survival and dispersal compared to simply breaking into fragments.

◆ How do Organisms Reproduce?

Q27. deep | thorough-understanding | § 7.2.6 Spore Formation **[3]**

Spore formation is classified as asexual reproduction, just like budding and fragmentation. Yet spore formation is considered particularly advantageous for organisms like Rhizopus compared to fragmentation in Spirogyra. Justify this statement by connecting the structural features of spores to the conditions under which each mode succeeds or fails.

◆ How do Organisms Reproduce?

Q28. deep | thorough-understanding | § 7.3 SEXUAL REPRODUCTION **[3]**

During sexual reproduction, germ-cells undergo meiosis so that they contain only half the number of chromosomes found in normal body cells. Explain why this halving is essential for maintaining the chromosome number across generations, and describe what would happen if germ-cells were produced by ordinary cell division (mitosis) instead.

◆ How do Organisms Reproduce?

Q29. medium | thorough-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

Why does combining DNA from two different individuals during sexual reproduction not simply double the amount of DNA in each successive generation?

◆ How do Organisms Reproduce?

Q30. medium | thorough-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

Asexual reproduction can produce new individuals perfectly well. What specific advantage does sexual reproduction provide that asexual reproduction cannot, and why is that advantage important for a species over time?

◆ How do Organisms Reproduce?

Q31. deep | thorough-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

A student argues: 'If DNA-copying were made less accurate, sexual reproduction would be unnecessary because enough variation would already be generated asexually.' Using your understanding of what happens when DNA copying becomes too inaccurate, explain why this argument is flawed.

◆ How do Organisms Reproduce?

Q32. medium | thorough-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[1]**

Sexual reproduction combines variations from two parents rather than creating new mutations. Which of the following best explains why this makes sexual reproduction less risky for individual survival than relying on random DNA-copying errors for variation?

(A) Variations already tested in parents are less likely to be lethal than brand-new random mutations.
(B) Sexual reproduction always produces more offspring than asexual reproduction.
(C) Gametes formed by meiosis never carry copying errors.
(D) Combining two genomes eliminates all harmful variations from both parents.

A Two individuals always carry identical variations, so there is no risk of incompatibility.
B Because both individuals are already alive, their accumulated variations are known not to be fatally harmful.
C Sexual reproduction eliminates all harmful mutations before they are passed on.
D The process of meiosis corrects any dangerous DNA errors before fusion of germ-cells.

◆ How do Organisms Reproduce?

Q33. medium | thorough-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[2]**

Why are germ-cells in complex multicellular organisms produced by meiosis rather than by the same cell division that produces ordinary body cells?

◆ How do Organisms Reproduce?

Q34. deep | thorough-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[3]**

In simple organisms, the two fusing germ-cells may look identical, but in complex organisms one gamete is large and non-motile while the other is small and motile. Give a biological explanation for why gametes in complex organisms are differentiated in this way, and state what each design feature achieves.

◆ How do Organisms Reproduce?

Q35. medium | thorough-understanding | § 7.3.1 Why the Sexual Mode of Reproduction? **[2]**

In complex multicellular organisms, the female gamete is significantly larger than the male gamete. Give a biological reason for this size difference, and explain at what stage of reproduction this stored material becomes important.

◆ How do Organisms Reproduce?

Q36. medium | thorough-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[1]**

A flower has its stamens removed before its pollen matures. Which of the following outcomes is most likely?

(A) The flower can still undergo self-pollination but not cross-pollination.
(B) The flower can still be fertilised if pollen arrives from another flower of the same species.
(C) The ovules in the flower will automatically develop into seeds without fertilisation.
(D) The pistil will stop producing egg cells.

A The flower can still undergo self-pollination but not cross-pollination.
B The flower can still be fertilised if pollen arrives from another flower of the same species.
C The ovules in the flower will automatically develop into seeds without fertilisation.
D The pistil will stop producing egg cells.

◆ How do Organisms Reproduce?

Q37. medium | thorough-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[3]**

After pollen lands on the stigma, it cannot directly fuse with the egg cell. Explain the sequence of events that bridges this gap and results in fertilisation.

◆ How do Organisms Reproduce?

Q38. medium | thorough-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[3]**

After fertilisation in a flowering plant, the zygote and the ovule undergo a series of changes. Trace the developmental journey from zygote to seed, and separately describe what happens to the ovary during this period. What is the biological significance of the structure that forms from the ovary?

◆ **How do Organisms Reproduce?**

Q39. medium | thorough-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[2]**

Why is it essential for pollen to land on the stigma of a flower of the same species rather than just any surface, for reproduction to succeed?

◆ **How do Organisms Reproduce?**

Q40. deep | thorough-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[3]**

A flowering plant produces flowers that are functionally unisexual — bearing only pistils and no stamens. (a) Can such a plant reproduce sexually without external agents? Give a reason. (b) Identify two agents that could bring about pollination in such a plant and explain how each achieves this.

◆ **How do Organisms Reproduce?**

Q41. deep | thorough-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[3]**

Both the ovule and the ovary undergo changes after fertilisation in a flowering plant. Distinguish between the structures each one gives rise to, and explain the biological importance of each resulting structure.

◆ **How do Organisms Reproduce?**

Q42. deep | thorough-understanding | § 7.3.2 Sexual Reproduction in Flowering Plants **[5]**

Distinguish between pollination and fertilisation in flowering plants on the basis of: (i) the structures involved, (ii) where each process occurs, and (iii) the outcome of each process. How does pollination set the stage for fertilisation to take place?

◆ **How do Organisms Reproduce?**

Q43. medium | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[2]**

Testes in humans are located outside the abdominal cavity in the scrotum. Why is this positioning necessary for their function?

◆ **How do Organisms Reproduce?**

Q44. medium | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

A student says: 'The urethra in males is part of the excretory system, so it plays no role in reproduction.' Do you agree? Justify your answer.

◆ **How do Organisms Reproduce?**

Q45. straightforward | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[1]**

The male reproductive system includes accessory glands such as the seminal vesicles and prostate gland. Why are the secretions of these glands essential for the survival and functioning of sperms outside the testes?

◆ **How do Organisms Reproduce?**

Q46. medium | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

Trace the journey of a sperm cell from where it is produced to where fertilisation occurs in the female body. Name each structure it passes through in order.

◆ **How do Organisms Reproduce?**

Q47. medium | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[2]**

Explain any TWO distinct functions performed by the placenta during the development of the embryo in the uterus.

◆ How do Organisms Reproduce?

Q48. deep | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

A fertilised egg implants in the uterine lining, which has become thick and richly supplied with blood. If the same uterine lining breaks down and is shed a few weeks later, what does this tell you about whether fertilisation occurred that month? Explain the mechanism behind what you observe.

◆ How do Organisms Reproduce?

Q49. medium | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[2]**

Why does the uterus prepare its lining every month even before it is known whether fertilisation will occur?

◆ How do Organisms Reproduce?

Q50. deep | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

A copper-T placed in the uterus prevents pregnancy but does NOT protect against sexually transmitted infections (STIs). In contrast, a condom can do both. What structural difference in how these two contraceptives work explains this difference in protection?

◆ How do Organisms Reproduce?

Q51. deep | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

Secondary sexual characters such as changed voice or new hair-growth patterns appear during puberty but are not directly involved in the production of gametes. Why are these changes considered significant in the context of sexual reproduction?

◆ How do Organisms Reproduce?

Q52. medium | thorough-understanding | § 7.3.3 Reproduction in Human Beings **[3]**

Both a surgical block of the vas deferens in the male and a surgical block of the fallopian tube in the female prevent fertilisation, yet through different mechanisms. Explain precisely why each method prevents fertilisation.

◆ How do Organisms Reproduce?

Q53. medium | thorough-understanding | § 7.3.3 (a) Male Reproductive System **[3]**

Sperm production in the testes requires a temperature lower than normal body temperature. How does the human body ensure this condition, and why would failure to maintain it affect fertility?

◆ How do Organisms Reproduce?

Q54. deep | thorough-understanding | § 7.3.3 (a) Male Reproductive System **[3]**

The sperms produced in the testes are not immediately capable of fertilising an egg on their own. Explain what additional contributions are made to the semen before it leaves the male reproductive system, and analyse why these contributions are essential for the sperms to function effectively.

◆ How do Organisms Reproduce?

Q55. medium | thorough-understanding | § 7.3.3 (b) Female Reproductive System **[3]**

A sperm must travel from the vagina all the way to the oviduct to fertilise an egg. Trace the path it takes, naming each structure in order.

◆ How do Organisms Reproduce?

Q56. medium | thorough-understanding | § 7.3.3 (b) Female Reproductive System **[3]**

The uterine lining thickens and becomes richly supplied with blood every month even before fertilisation has occurred. Why does this happen, and what triggers its breakdown if the egg is not fertilised?

◆ How do Organisms Reproduce?

Q57. deep | thorough-understanding | § 7.3.3 (b) Female Reproductive System **[3]**

The placenta plays a crucial role in the survival of the developing embryo. (i) Describe the structural features of the placenta that make it well-suited for its function. (ii) Name and explain TWO specific exchanges that take place between the mother's blood and the embryo across the placenta.

◆ How do Organisms Reproduce?

Q58. medium | thorough-understanding | § 7.3.3 (c) What happens when the Egg is not Fertilised? **[3]**

A girl notices that the uterine lining builds up each month but breaks down and is shed if no fertilisation occurs. Explain WHY the uterine lining is built up in the first place, and what triggers its breakdown and shedding as menstruation.

◆ How do Organisms Reproduce?

Q59. medium | thorough-understanding | § 7.3.3 (d) Reproductive Health **[3]**

A 14-year-old shows signs of early sexual maturation. Does this mean their reproductive system is fully developed and their body is biologically prepared for parenthood? Justify your answer with reference to the changes that occur during puberty.

◆ How do Organisms Reproduce?

Q60. medium | thorough-understanding | § 7.3.3 (d) Reproductive Health **[3]**

Why are condoms considered more useful than most other contraceptive methods for a person with multiple sexual partners?

◆ How do Organisms Reproduce?

Q61. deep | thorough-understanding | § 7.3.3 (d) Reproductive Health **[3]**

A couple relies solely on oral contraceptive pills for reproductive health protection. Evaluate whether this is a completely safe and sufficient strategy. Explain your answer with reference to what oral pills can and cannot prevent.

◆ How do Organisms Reproduce?

Q62. straightforward | thorough-understanding | § 7.3.3 (d) Reproductive Health **[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?

Q63. deep | thorough-understanding | § 7.3.3 (d) Reproductive Health **[3]**

Blocking the vas deferens and blocking the fallopian tube both prevent fertilisation, yet they are fundamentally different procedures. Explain why each works, and identify one thing they have in common beyond preventing pregnancy.

◆ How do Organisms Reproduce?

Q64. medium | thorough-understanding | § 7.3.3 (d) Reproductive Health **[2]**

Why can the copper-T cause side effects that a barrier method like a condom does not?

◆ How do Organisms Reproduce?

Q65. deep | thorough-understanding | § 7.3.3 (d) Reproductive Health **[3]**

In a region where sex-selective abortion of female foetuses is practised, what would be the long-term biological and social consequences for that population? Explain.

◆ How do Organisms Reproduce?

Q66. deep | thorough-understanding | § 7.3.3 (d) Reproductive Health **[5]**

An adolescent girl is pressured by her family to marry and bear children before she has fully completed puberty. Using your understanding of the development of the female reproductive system, explain the potential health risks this could pose to her.

◆ How do Organisms Reproduce?

Q67. medium | thorough-understanding | § 7.3.3 (d) Reproductive Health **[3]**

Name any two bacterial and two viral sexually transmitted infections. For one of them, state a method that can reduce (but may not completely eliminate) its transmission.

◆ How do Organisms Reproduce?

Q68. deep | thorough-understanding | § (whole-chapter synthesis) **[3]**

Asexual reproduction produces offspring with very little genetic variation, yet it is widely used in nature. Sexual reproduction generates greater variation but requires two individuals. Given that variation is beneficial for species survival, why do so many organisms still rely on asexual reproduction rather than switching entirely to sexual reproduction?

◆ How do Organisms Reproduce?

Q69. deep | thorough-understanding | § (whole-chapter synthesis) **[3]**

[short_answer] Spore formation, vegetative propagation, and budding are structurally very different processes, yet they are all classified as asexual reproduction. What single underlying cellular property unites them, and how does each process exploit that property in a distinct way? Illustrate your answer with one named example of each process.

◆ How do Organisms Reproduce?

Q70. medium | thorough-understanding | § (whole-chapter synthesis) **[3]**

In both flowering plants and human beings, fertilisation produces a zygote that must be nourished as it develops. Compare the structural adaptations that serve this nutritional function in each case.

◆ How do Organisms Reproduce?

Q71. deep | thorough-understanding | § (whole-chapter synthesis) **[3]**

A student argues: 'Since DNA copying already introduces small variations, there is no added advantage to sexual reproduction — asexual reproduction should be sufficient for generating the variation needed for evolution.' Identify the flaw in this argument using your understanding of how sexual reproduction generates variation differently from DNA-copying errors alone.

◆ How do Organisms Reproduce?

Q72. medium | thorough-understanding | § (whole-chapter synthesis) **[1]**

[mcq] Sperms are produced in the testes, which are located in scrotal sacs outside the abdominal cavity. Which of the following correctly explains this structural arrangement?
(A) The scrotal sacs protect the testes from mechanical injury during movement.
(B) Sperm production requires a temperature slightly lower than normal body temperature.
(C) The scrotal position allows sperms to be released directly into the urethra without travelling far.
(D) The testes need a rich blood supply that is only available outside the abdomen.

A Sperm formation needs a lower temperature than body temperature; the tail provides motility to reach the female germ-cell.
B Sperm formation needs a lower temperature than body temperature; the tail stores the genetic material needed for fertilisation.
C Sperm formation needs a higher temperature than body temperature; the tail provides motility to reach the female germ-cell.
D The testes must be outside to allow easy release of sperms; the tail helps the sperm penetrate the egg wall.

◆ **How do Organisms Reproduce?**

Q73. medium | thorough-understanding | § (whole-chapter synthesis) **[5]**

Trace the complete journey of a male gamete — from the moment it is produced in the human body to the moment fertilisation occurs — naming each structure it passes through and the key event at each stage.

◆ **How do Organisms Reproduce?**

Q74. deep | thorough-understanding | § (whole-chapter synthesis) **[5]**

[long_answer] When fertilisation does not occur in a human female, the thickened uterine lining is shed as menstruation. In a flowering plant, once fertilisation is complete, the ovary develops into a fruit and the ovules into seeds that are eventually dispersed. (i) Explain the biological events that trigger menstruation, and describe how the uterus prepares itself for the next reproductive cycle. (ii) Explain how fertilisation transforms the ovary and ovule, and why dispersal of seeds is important for the survival of the species. (iii) In what sense does each process — menstruation and seed dispersal — represent a 'reset' that prepares the organism for a future reproductive attempt?

◆ **How do Organisms Reproduce?**

Q75. medium | thorough-understanding | § (whole-chapter synthesis) **[3]**

Copper-T and surgical blocking of the fallopian tube are both contraceptive methods used in females, but they prevent pregnancy at entirely different stages of the reproductive process. Explain the mechanism of each and identify the stage — gamete production, fertilisation, or implantation — at which each method acts.

◆ **How do Organisms Reproduce?**

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