School Connect Online

SCO INTERNATIONAL OLYMPIAD

GRADE 10 IBO – BIOLOGY OLYMPIAD OFFICIAL QUESTION PAPER

Official Grade 10 Biology Olympiad paper with corrected academic scope, answer key, explanations, and compact question-block formatting.

Designed for Grade 10 Biology learners with SCO's guided preparation, practice, reporting, and future-ready academic growth.

- age-fit biology learning guidance for Grade 10 learners globally
- chapter-wise outcomes, structured practice, reasoning questions, and clear answer explanations

Life Processes	Control & Coordination	Reproduction
Heredity	Environment	Resources

CLASS		SET
10	IBO SCO INTERNATIONAL BIOLOGY OLYMPIAD	H

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Guidelines for the Candidate

Total Questions: 50	Time: 1 hour	Mode: OMR / Online

Name: ..... Registration ID: .....

School: ..... Contact No.: .....

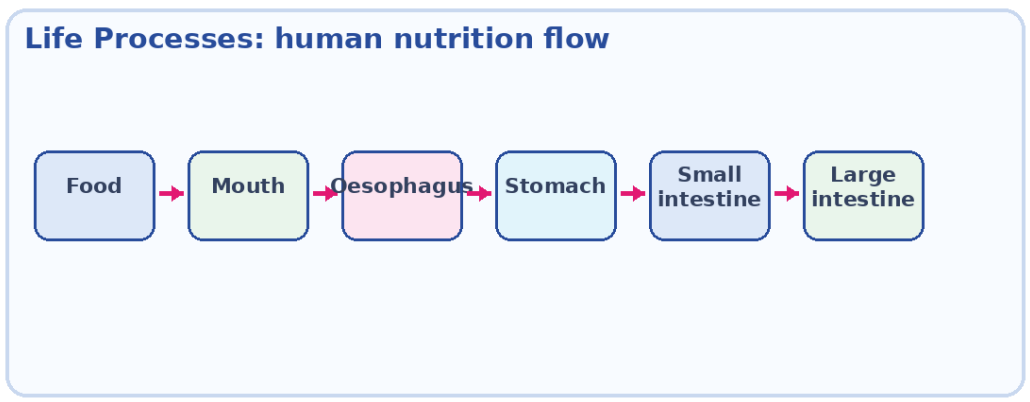
1. Before the exam begins, candidates may use the additional time provided by the invigilator to complete personal details on the OMR Sheet.
2. Clearly write name, school code, class, roll number, and registration details in the space provided.
3. The paper has four parts: General Questions, Case Study Questions, Reason/Assertion Questions, and Achievers Section.
4. Each Achievers Section question carries 2 marks; all other questions carry 1 mark unless otherwise notified by SCO.
5. Every question has only one correct answer. Select one option only.
6. Use only an HB pencil or a blue/black ballpoint pen to mark answers on the OMR sheet, or follow the online-test instructions if appearing online.
7. Calculator use is not allowed unless the official exam instructions state otherwise.
8. At the end of the test, submit the OMR sheet or complete the online submission as instructed.

Section A - Life Processes and Control & Coordination (Q1 to Q20)

Q1. A leaf is kept in darkness for 48 hours and then exposed to sunlight after covering part of it with black paper. After the starch test, only the exposed part turns blue-black. What does this prove?

A. Carbon dioxide is not needed for photosynthesis
B. Light is necessary for photosynthesis
C. Oxygen is necessary for photosynthesis
D. Water is produced during photosynthesis

Q2. Which sequence correctly shows the path of food in the human digestive system?



A. Mouth → stomach → oesophagus → small intestine
B. Mouth → oesophagus → stomach → small intestine → large intestine
C. Mouth → small intestine → stomach → large intestine
D. Stomach → mouth → oesophagus → large intestine

Q3. Which part of the small intestine increases surface area for absorption of digested food?

A. Alveoli
B. Villi
C. Nephrons
D. Platelets

Q4. A person runs fast and begins to breathe more rapidly. Which change explains this response?

A. Muscle cells need more oxygen for respiration
B. The body stops producing carbon dioxide
C. Digestion becomes faster than respiration
D. The kidneys begin to absorb oxygen

Q5. In humans, which blood vessel carries oxygenated blood from the lungs to the heart?

A. Pulmonary artery
B. Pulmonary vein
C. Vena cava
D. Hepatic portal vein

Q6. Which statement best describes double circulation in humans?

A. Blood passes through the heart once in one complete cycle
B. Blood passes through the heart twice in one complete cycle
C. Blood never enters the lungs
D. Oxygenated and deoxygenated blood always mix completely

Q7. The functional unit of the kidney that filters blood and forms urine is the:

A. Nephron
B. Neuron
C. Alveolus
D. Villus

Q8. Which is the correct role of stomata in a leaf?

A. Absorb minerals from soil
B. Exchange gases and regulate water loss
C. Transport food through xylem
D. Produce seeds after fertilisation

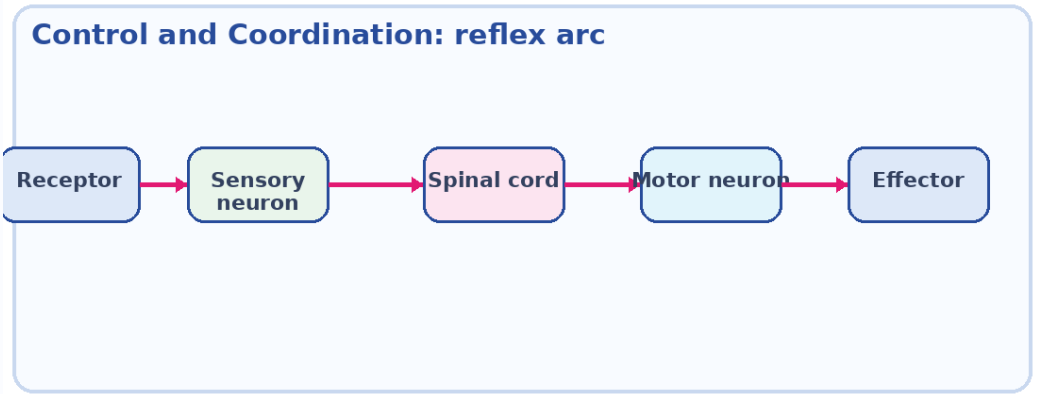
Q9. A plant is kept in very dry soil. Which response will help it reduce water loss?

A. Opening stomata wider
B. Closing stomata
C. Increasing leaf surface area
D. Stopping root absorption permanently

Q10. Which of the following is a waste product of aerobic respiration?

A. Glucose
B. Carbon dioxide
C. Starch
D. Chlorophyll

Q11. A student touches a hot object and immediately pulls the hand back. Which pathway shows the response correctly?



A. Brain → receptor → muscle
B. Receptor → sensory neuron → spinal cord → motor neuron → muscle
C. Muscle → brain → receptor
D. Spinal cord → receptor → sensory neuron

Q12. Which hormone is commonly associated with the “fight or flight” response?

A. Insulin
B. Thyroxine
C. Adrenaline
D. Estrogen

Q13. A plant bends toward light. This movement is called:

A. Geotropism
B. Phototropism
C. Hydrotropism
D. Chemotropism

Q14. Which part of the brain mainly coordinates balance and posture?

A. Cerebellum
B. Cerebrum
C. Medulla
D. Spinal cord

Q15. Deficiency of iodine in the diet mainly affects the production of which hormone?

A. Insulin
B. Thyroxine
C. Adrenaline
D. Testosterone

Q16. In a neuron, the electrical impulse normally travels from:

A. Axon ending to dendrite to cell body
B. Dendrite to cell body to axon
C. Cell body to dendrite to axon ending
D. Axon to nucleus to dendrite

Q17. Which plant hormone helps in cell elongation and is responsible for bending of shoots toward light?

A. Auxin
B. Insulin
C. Cytokinin only
D. Thyroxine

Q18. Which endocrine gland controls blood glucose by secreting insulin?

A. Pituitary
B. Pancreas
C. Thyroid
D. Adrenal

Q19. Why are chemical hormones slower than nerve impulses but longer lasting?

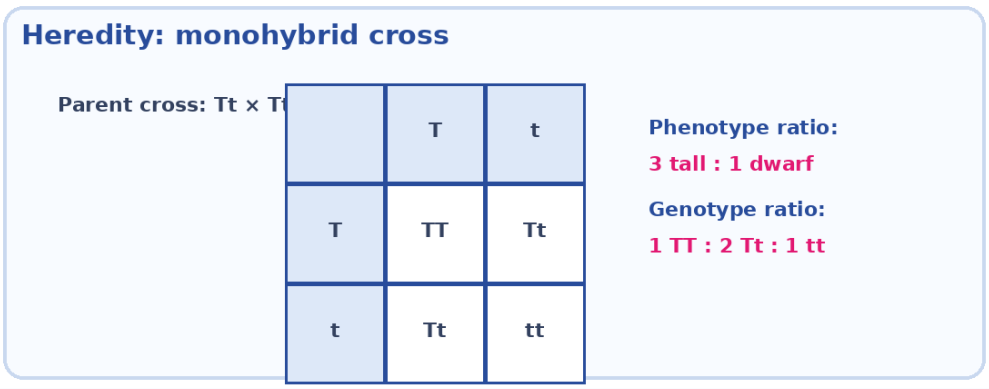
A. Hormones travel through blood and act on target organs
B. Hormones are always carried by neurons
C. Hormones do not need receptors
D. Hormones are produced only in muscles

Q20. Which condition is most likely when insulin secretion is insufficient or body cells do not respond properly to insulin?

A. Diabetes mellitus
B. Anaemia
C. Malaria
D. Scurvy

Section B - Reproduction and Heredity (Q21 to Q30)

Q21. A farmer grows pea plants. Tallness (T) is dominant over dwarfness (t). If two heterozygous tall plants are crossed, which ratio of tall to dwarf offspring is expected?



A. 1 : 1
B. 2 : 1
C. 3 : 1
D. 1 : 3

Q22. Which structure transfers pollen grains from the anther to the stigma during pollination?

A. Ovule
B. Pollen tube
C. Wind, water, insects, or other agents
D. Sepal only

Q23. Which statement correctly describes fertilisation in flowering plants?

A. Fusion of male and female gametes forms a zygote
B. Formation of pollen grains is fertilisation
C. Germination of seed is fertilisation
D. Transfer of pollen to stigma is fertilisation

Q24. Which method is an example of asexual reproduction?

A. Seed formation in mango
B. Budding in yeast
C. Fertilisation in humans
D. Pollination in flowers

Q25. Which of the following is a correct function of the placenta in humans?

A. It produces bile for digestion
B. It helps exchange nutrients, gases, and wastes between mother and embryo

C. It stores urine in the foetus
D. It forms red blood cells in adults

Q26. A child receives one set of chromosomes from the mother and one from the father. This explains:

A. Why offspring inherit traits from both parents
B. Why all children are identical
C. Why chromosomes disappear after birth
D. Why only acquired traits are inherited

Q27. Which of these traits is least likely to be inherited by the next generation?

A. Eye colour
B. Blood group
C. A scar acquired after an accident
D. Seed shape in pea plants

Q28. In humans, the sex of a baby is determined by:

A. The type of sex chromosome carried by the sperm
B. The number of meals eaten by the mother
C. The number of red blood cells
D. The blood group of the mother only

Q29. Which process creates variation by producing new combinations of genes in offspring?

A. Cloning only
B. Sexual reproduction
C. Binary fission only
D. Vegetative propagation only

Q30. Which statement best explains why variation is useful for a population?

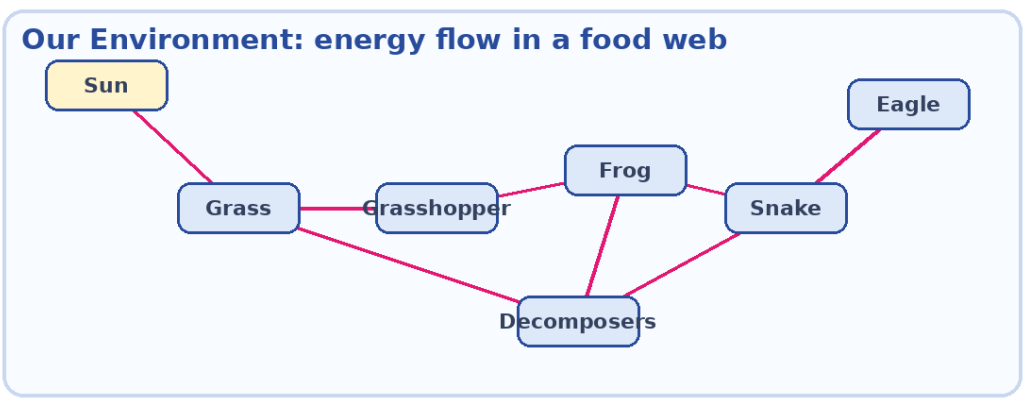
A. It ensures all individuals die together
B. It helps some individuals survive when the environment changes
C. It prevents reproduction
D. It removes all differences permanently

Section C - Environment and Natural Resources (Q31 to Q40)

Q31. A pond has algae, small fish, large fish, and birds. If too many algae grow because of fertiliser runoff, oxygen may fall and fish may die. This is mainly an example of:

A. Biomagnification
B. Eutrophication
C. Mutation
D. Pollination

Q32. In the food chain grass → grasshopper → frog → snake, which organism is the primary consumer?



A. Grass
B. Grasshopper
C. Frog
D. Snake

Q33. Why is energy transfer from one trophic level to the next usually low?

A. Most energy is lost as heat and used in life processes
B. Producers do not capture energy
C. Consumers create energy from nothing
D. Decomposers block sunlight

Q34. Which group is most responsible for recycling nutrients from dead organisms?

A. Decomposers
B. Carnivores only
C. Producers only
D. Primary consumers only

Q35. Which of the following is biodegradable?

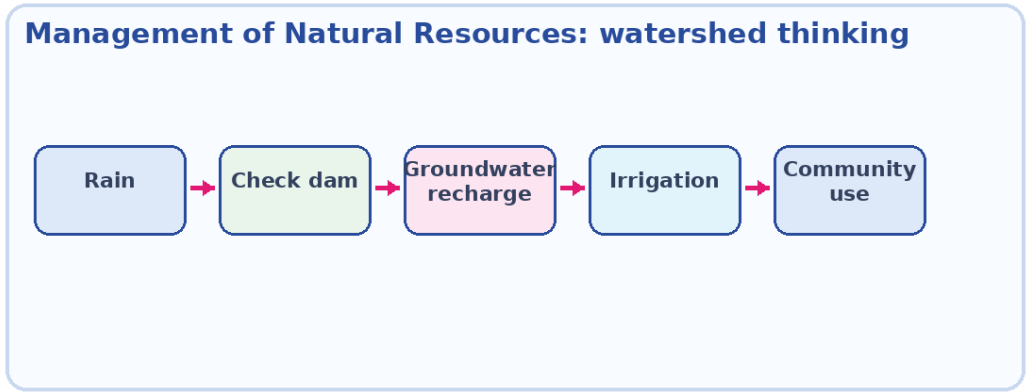
A. Banana peel
B. Plastic bag

C. Glass bottle
D. Aluminium foil

Q36. Why can pesticides become more concentrated at higher trophic levels?

A. Biomagnification
B. Photosynthesis
C. Pollination
D. Germination

Q37. Which action best supports sustainable management of water resources?



A. Wasting groundwater because it is hidden
B. Building local rainwater harvesting systems
C. Dumping sewage into lakes
D. Cutting all vegetation near streams

Q38. The 3R approach in resource management means:

A. Read, Repeat, Revise
B. Reduce, Reuse, Recycle
C. Rain, River, Reservoir
D. Root, Respire, Reproduce

Q39. Why is biodiversity important for ecosystem stability?

A. It makes every species identical
B. It provides many interacting species and ecological roles
C. It removes decomposers
D. It prevents energy flow

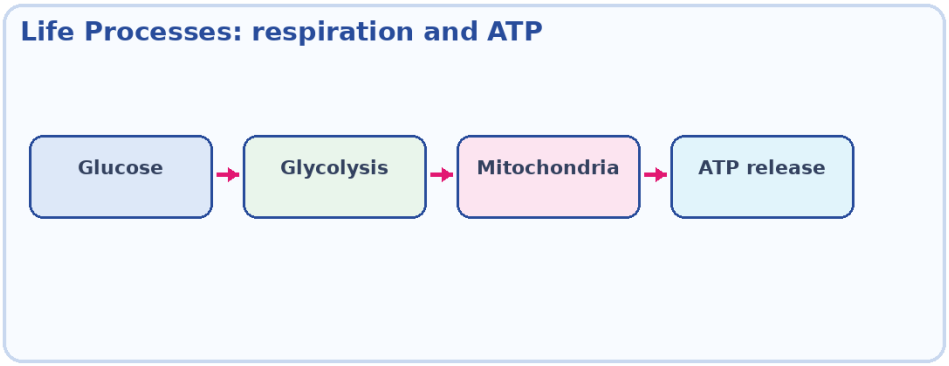
Q40. Which is the most responsible way to use forests?

A. Clear all forests for short-term timber
B. Harvest carefully and replant native species

C. Burn forests to produce ash
D. Replace forests only with concrete roads

Section D - Reason / Assertion and Achievers Section (Q41 to Q50)

Q41. Assertion (A): Mitochondria are called the powerhouse of the cell. Reason (R): Mitochondria produce ATP during cellular respiration.



A. Both A and R are true, and R correctly explains A
B. Both A and R are true, but R does not explain A
C. A is true, R is false
D. A is false, R is true

Q42. Assertion (A): Reflex actions are rapid and involuntary. Reason (R): Many reflexes are coordinated by the spinal cord before the brain is consciously involved.

A. Both A and R are true, and R correctly explains A
B. Both A and R are true, but R does not explain A
C. A is true, R is false
D. A is false, R is true

Q43. Assertion (A): The offspring of sexually reproducing organisms show variation. Reason (R): Sexual reproduction combines genetic material from two parents.

A. Both A and R are true, and R correctly explains A
B. Both A and R are true, but R does not explain A
C. A is true, R is false
D. A is false, R is true

Q44. Assertion (A): Non-biodegradable chemicals may harm top consumers more severely. Reason (R): These chemicals may accumulate and increase in concentration along food chains.

A. Both A and R are true, and R correctly explains A
B. Both A and R are true, but R does not explain A
C. A is true, R is false
D. A is false, R is true

Q45. Assertion (A): Stomata close during water stress. Reason (R): Stomatal closure reduces water loss through transpiration.

A. Both A and R are true, and R correctly explains A
B. Both A and R are true, but R does not explain A
C. A is true, R is false
D. A is false, R is true

Q46. A student observes that a destarched leaf placed in sunlight turns blue-black with iodine. Which conclusion is most accurate?

A. Starch was formed during photosynthesis
B. Protein was formed in the leaf
C. No food was made
D. Iodine destroyed chlorophyll

Q47. Which pairing is correct?

A. Xylem - transports food
B. Phloem - transports food
C. Stomata - absorbs minerals from soil
D. Villi - forms urine

Q48. Which statement best explains why vegetative propagation is useful in agriculture?

A. It produces genetically similar plants quickly
B. It always creates maximum variation
C. It needs fertilisation in every case
D. It prevents all plant diseases

Q49. If a pesticide is sprayed repeatedly in a field, why should it be used with caution?

A. It may enter food chains and accumulate
B. It always becomes useful compost
C. It increases biodiversity automatically
D. It prevents all pollution permanently

Q50. Which option best connects natural resource management with future generations?

A. Use resources faster than they form
B. Balance current needs with conservation so future users also benefit
C. Stop all human use of resources forever
D. Use only non-renewable resources

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Answer Key

1. B	2. B	3. B	4. A	5. B	6. B	7. A	8. B	9. B	10. B
11. B	12. C	13. B	14. A	15. B	16. B	17. A	18. B	19. A	20. A
21. C	22. C	23. A	24. B	25. B	26. A	27. C	28. A	29. B	30. B
31. B	32. B	33. A	34. A	35. A	36. A	37. B	38. B	39. B	40. B
41. A	42. A	43. A	44. A	45. A	46. A	47. B	48. A	49. A	50. B

Detailed Explanations

Q1. Answer B: The uncovered region receives light and synthesizes starch. The covered region cannot photosynthesise, so it does not turn blue-black with iodine.

Q2. Answer B: Food travels from the mouth to the oesophagus, then into the stomach, small intestine, and finally the large intestine.

Q3. Answer B: Villi are finger-like projections in the small intestine. They increase surface area and help absorb digested nutrients efficiently.

Q4. Answer A: During exercise, muscles require more ATP. Increased breathing brings more oxygen and removes more carbon dioxide.

Q5. Answer B: The pulmonary vein is exceptional because it carries oxygenated blood from the lungs to the left atrium of the heart.

Q6. Answer B: In double circulation, blood passes through the heart once for pulmonary circulation and once for systemic circulation, keeping oxygenated and deoxygenated blood separate.

Q7. Answer A: Nephrons filter blood, reabsorb useful substances, and help form urine.

Q8. Answer B: Stomata allow carbon dioxide and oxygen exchange and also regulate transpiration by opening and closing.

Q9. Answer B: Closing stomata reduces transpiration, helping plants conserve water during drought stress.

Q10. Answer B: Aerobic respiration breaks down glucose using oxygen and releases carbon dioxide, water, and energy.

Q11. Answer B: In a reflex action, the stimulus travels from receptor to sensory neuron, then spinal cord, motor neuron, and effector muscle.

Q12. Answer C: Adrenaline prepares the body for emergency action by increasing heart rate, breathing rate, and blood supply to muscles.

Q13. Answer B: Phototropism is directional growth in response to light. Shoots generally show positive phototropism.

Q14. Answer A: The cerebellum coordinates muscle movement, posture, and balance.

Q15. Answer B: The thyroid gland needs iodine to produce thyroxine. Deficiency may lead to goitre and metabolic imbalance.

Q16. Answer B: Dendrites receive impulses, the cell body processes them, and the axon carries impulses away.

Q17. Answer A: Auxin accumulates more on the shaded side, causing cells there to elongate and the shoot to bend toward light.

Q18. Answer B: The pancreas secretes insulin, which helps cells take up glucose from blood.

Q19. Answer A: Hormones are chemical messengers released into blood. They travel more slowly than nerve impulses but can produce sustained effects.

Q20. Answer A: Diabetes mellitus involves high blood glucose due to insufficient insulin or reduced response to insulin.

Q21. Answer C: The cross Tt × Tt gives genotypes TT, Tt, Tt, and tt. Three show tall phenotype and one is dwarf.

Q22. Answer C: Pollination is the transfer of pollen from anther to stigma. This transfer may be carried out by wind, water, insects, or other agents.

Q23. Answer A: Fertilisation is the fusion of male and female gametes to form a zygote.

Q24. Answer B: Budding in yeast produces a new organism from an outgrowth of the parent without fusion of gametes.

Q25. Answer B: The placenta connects the developing embryo with the mother and allows exchange of food, oxygen, and wastes.

Q26. Answer A: Sexual reproduction combines genetic material from both parents, so offspring show inherited variation.

Q27. Answer C: Acquired characters such as scars usually do not change the DNA of reproductive cells and therefore are not inherited.

Q28. Answer A: The egg always contributes an X chromosome, while sperm may contribute X or Y. Therefore the sperm determines the genetic sex of the child.

Q29. Answer B: Sexual reproduction combines gametes from two parents and creates new gene combinations, increasing variation.

Q30. Answer B: Genetic variation increases the chance that some organisms may be better adapted to new conditions.

Q31. Answer B: Excess nutrients cause algal bloom. Decomposition of algae consumes oxygen, which can kill aquatic animals.

Q32. Answer B: The grasshopper eats the producer grass, so it is the primary consumer.

Q33. Answer A: Only a small fraction of energy passes to the next trophic level; much is used in metabolism and lost as heat.

Q34. Answer A: Decomposers break down dead organic matter and return nutrients to soil and water.

Q35. Answer A: A banana peel can be decomposed by microorganisms; the other materials persist much longer.

Q36. Answer A: Non-biodegradable chemicals accumulate in organisms and become more concentrated up the food chain.

Q37. Answer B: Rainwater harvesting and groundwater recharge conserve local water and reduce dependence on distant sources.

Q38. Answer B: The 3Rs reduce waste and conserve materials by reducing use, reusing objects, and recycling materials.

Q39. Answer B: Biodiversity increases resilience because many species contribute to food webs, nutrient cycling, pollination, and other processes.

Q40. Answer B: Sustainable forestry balances human use with conservation and regeneration of forest ecosystems.

Q41. Answer A: Mitochondria release usable energy as ATP during respiration, so the reason correctly explains the assertion.

Q42. Answer A: The spinal cord pathway shortens response time, which explains why reflex actions are fast and involuntary.

Q43. Answer A: New combinations of genes arise from two parents, causing variation in offspring.

Q44. Answer A: Biomagnification explains why top consumers can accumulate higher concentrations of persistent chemicals.

Q45. Answer A: Closing stomata reduces transpiration, conserving water during stress.

Q46. Answer A: Iodine turns blue-black in the presence of starch, indicating that photosynthesis produced starch in the leaf.

Q47. Answer B: Phloem transports prepared food from leaves to other parts of the plant.

Q48. Answer A: Vegetative propagation helps multiply plants with desirable traits rapidly and produces genetically similar offspring.

Q49. Answer A: Some pesticides persist and may accumulate in organisms, causing ecological and health risks.

Q50. Answer B: Sustainable management means meeting present needs while protecting resources and ecosystems for the future.