School Connect Online

SCO INTERNATIONAL OLYMPIAD

GRADE 10 IBO – BIOLOGY OLYMPIAD OFFICIAL SAMPLE QUESTION PAPER

Grade 10 Biology Olympiad sample paper with answer key and detailed explanations for practice and website publishing.

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
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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 - General Questions (Q1 to Q20)

Q1. A plant kept in a closed container without carbon dioxide is exposed to sunlight. Which result is most likely in the starch test?

A. Strong blue-black colour because light is present
B. No starch formation because carbon dioxide is required
C. More starch than usual because air is absent
D. The leaf becomes a seed

Q2. Which digestive juice contains acid that helps kill microbes and creates an acidic medium in the stomach?

A. Saliva
B. Gastric juice
C. Bile
D. Pancreatic juice

Q3. Bile helps digestion mainly by:

A. Breaking proteins into amino acids
B. Emulsifying fats into small droplets
C. Absorbing glucose into blood
D. Producing insulin

Q4. Which component of blood transports oxygen from lungs to body cells?

A. Plasma only
B. Red blood cells containing haemoglobin
C. Platelets
D. White blood cells only

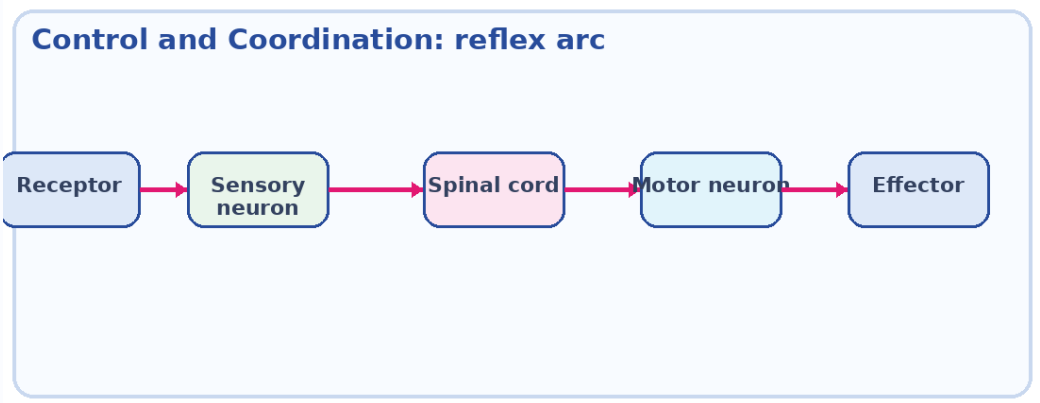
Q5. Which process removes metabolic wastes from the body?

A. Nutrition
B. Excretion
C. Reproduction
D. Pollination

Q6. During respiration, glucose is broken down in the presence of oxygen to release:

A. Oxygen and starch
B. Energy, carbon dioxide, and water
C. Chlorophyll and proteins
D. Nitrogen and glucose

Q7. Which diagram correctly represents the main path of reflex action?



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

Q8. Which plant movement is shown when roots grow downward into the soil?

A. Positive geotropism
B. Negative phototropism
C. Chemotropism only
D. Random movement

Q9. A person with very low thyroid hormone may show slow metabolism. Which gland is involved?

A. Thyroid gland
B. Pancreas
C. Salivary gland
D. Sweat gland

Q10. Which part of the nervous system carries messages from sense organs to the central nervous system?

A. Sensory neurons
B. Motor neurons
C. Platelets
D. Alveoli

Q11. Which part of the human brain controls involuntary actions such as breathing and heartbeat?

A. Cerebrum
B. Medulla
C. Cerebellum
D. Hypothalamus only

Q12. Insulin lowers blood sugar mainly by:

A. Increasing glucose uptake by cells
B. Turning blood into oxygen
C. Stopping digestion permanently
D. Producing bile

Q13. Which is the male reproductive part of a flower?

A. Stamen
B. Pistil
C. Sepal
D. Ovule

Q14. Which event comes immediately after pollen grains land on a suitable stigma?

A. Pollen tube growth toward the ovule
B. Seed dispersal
C. Formation of roots
D. Photosynthesis stops

Q15. Which is an example of fragmentation?

A. A Spirogyra filament breaks into pieces and each grows into a new filament
B. A seed grows into a tree
C. A human baby is born
D. A flower produces nectar

Q16. Which method of reproduction generally produces more variation?

A. Binary fission
B. Budding
C. Sexual reproduction
D. Vegetative propagation

Q17. In humans, where does fertilisation usually occur?

A. Oviduct/fallopian tube
B. Stomach
C. Kidney
D. Large intestine

Q18. Which structure becomes the seed after fertilisation in flowering plants?

A. Ovule
B. Anther
C. Stigma
D. Petal

Q19. Which statement about heredity is correct?

A. Genes are units of inheritance
B. Acquired muscle strength is always passed to children
C. Only mothers pass traits
D. All offspring are always identical

Q20. If a trait is recessive, it appears in the offspring when:

A. Only one dominant allele is present
B. Both alleles are recessive
C. No chromosomes are present
D. The environment removes DNA

Section B - Case Study and Applied Questions (Q21 to Q30)

Q21. A food chain has grass, deer, and tiger. Which organism is the producer?

A. Grass
B. Deer
C. Tiger
D. Decomposer

Q22. Which statement about a food web is correct?

A. It has only one straight feeding path
B. It contains interconnected food chains
C. It has no producers
D. It prevents energy flow

Q23. Which of the following is a non-biodegradable waste?

A. Vegetable peel
B. Paper under natural conditions
C. Plastic bottle
D. Fallen leaves

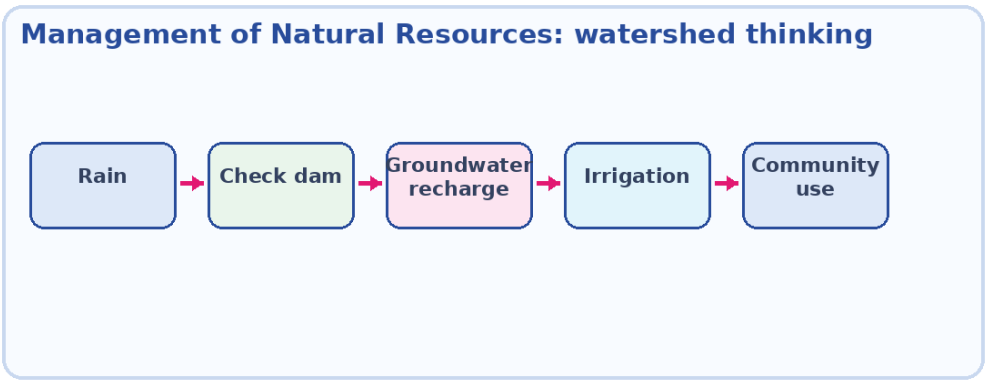
Q24. The ozone layer is important because it:

A. Absorbs much of the Sun's harmful ultraviolet radiation
B. Produces all oxygen in oceans
C. Increases pesticide concentration
D. Stops all rainfall

Q25. Which practice best reduces household solid waste?

A. Use and throw everything immediately
B. Reuse bottles and recycle paper where possible
C. Burn plastic in open air
D. Mix wet and dry waste always

Q26. Which resource-management method helps recharge groundwater?



A. Rainwater harvesting
B. Over-pumping borewells
C. Cutting forests
D. Dumping plastic in ponds

Q27. Why should local communities be involved in forest conservation?

A. They depend on forests and can help manage them sustainably
B. They should be excluded from all decisions
C. They always destroy forests
D. Conservation needs no human participation

Q28. Which is a renewable resource if managed properly?

A. Forests
B. Coal
C. Petroleum
D. Natural gas

Q29. Which action best conserves energy at school?

A. Keeping lights and fans on in empty rooms
B. Switching off electrical devices when not needed
C. Running taps continuously
D. Printing every page unnecessarily

Q30. Which of the following is an example of sustainable living?

A. Using public transport or cycling when possible
B. Throwing batteries into soil
C. Wasting water during cleaning
D. Burning dry leaves daily

Section C - Case Study and Applied Questions (Q31 to Q35)

Q31. Case Study: A student compared two leaves. Leaf A was exposed to sunlight, while Leaf B was covered with black paper. After iodine test, Leaf A turned blue-black. What is the correct inference?

A. Leaf A produced starch due to photosynthesis
B. Leaf B produced more starch
C. Black paper supplied carbon dioxide
D. Iodine produced food in the leaf

Q32. Case Study: A runner's breathing and heartbeat increase during a race. Which life process is being supported most directly?

A. Respiration for ATP production
B. Pollination
C. Seed dispersal
D. Heredity

Q33. Case Study: A potted plant bends toward a window. Which explanation is most appropriate?

A. Auxin causes greater elongation on the shaded side
B. The roots push the stem toward soil
C. The plant is responding to sound
D. Stomata pull the stem sideways

Q34. Case Study: A family has two children with different facial features though both have the same parents. What explains this?

A. Variation due to different combinations of inherited genes
B. Absence of chromosomes
C. Lack of reproduction
D. Identical cloning

Q35. Case Study: In a lake, a non-biodegradable pesticide enters through runoff. Later it is found at high levels in fish-eating birds. What is this process called?

A. Biomagnification
B. Germination
C. Translocation
D. Osmosis

Q36. Assertion (A): Xylem transports water and minerals upward in plants. Reason (R): Transpiration pull helps draw water from roots to leaves.

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

Q37. Assertion (A): The pancreas helps control blood glucose. Reason (R): It secretes insulin.

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

Q38. Assertion (A): Asexual reproduction produces offspring very similar to the parent. Reason (R): It generally involves only one parent and no fusion of gametes.

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

Q39. Assertion (A): Decomposers are essential in ecosystems. Reason (R): They recycle nutrients by breaking down dead organisms.

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

Q40. Assertion (A): Sustainable natural resource management is important. Reason (R): Overuse can reduce resource availability and damage ecosystems.

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

Section D - Achievers Section (Q41 to Q50)

Q41. Achievers: A leaf with blocked stomata shows reduced photosynthesis even in sunlight. Which explanation is best?

A. Less carbon dioxide enters the leaf
B. More oxygen enters the leaf
C. Roots stop absorbing minerals completely
D. Chlorophyll changes into starch

Q42. Achievers: A person has a damaged cerebellum. Which difficulty is most likely?

A. Poor balance and coordination
B. Inability to produce urine
C. No digestion of carbohydrates
D. No formation of pollen

Q43. Achievers: Two pea plants with genotype Tt and tt are crossed. What proportion of offspring is expected to be dwarf?

A. 0%
B. 25%
C. 50%
D. 100%

Q44. Achievers: A farmer uses cuttings to grow rose plants. What is one advantage?

A. Desired traits can be preserved
B. Every plant becomes genetically different
C. Fertilisation is always needed
D. It prevents photosynthesis

Q45. Achievers: In a food chain, which trophic level would usually have the least energy available?

A. Producer
B. Primary consumer
C. Secondary consumer
D. Top consumer

Q46. Achievers: Which pair is correctly matched?

A. Villi - gas exchange
B. Alveoli - gas exchange
C. Nephron - food absorption
D. Platelets - urine formation

Q47. Achievers: Why does the left ventricle have a thicker wall than the right ventricle?

A. It pumps blood to the entire body under higher pressure
B. It stores digestive enzymes
C. It receives urine from kidneys
D. It makes red blood cells

Q48. Achievers: In heredity, what does a dominant allele do?

A. Expresses its trait even when only one copy is present
B. Disappears in every generation
C. Changes into a chromosome
D. Appears only in females

Q49. Achievers: Which practice best prevents soil erosion on slopes?

A. Contour bunding and vegetation cover
B. Removing all plants
C. Overgrazing
D. Continuous mining

Q50. Achievers: Why are long food chains less common in ecosystems?

A. Energy loss at each trophic level limits the number of levels
B. Producers cannot make food
C. Decomposers stop all feeding
D. Consumers create unlimited energy

Answer Key

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

Detailed Explanations

Q1. Answer B: Light alone is not enough; carbon dioxide is a raw material for photosynthesis.

Q2. Answer B: Gastric juice contains hydrochloric acid, which helps kill many microbes and provides acidic conditions for enzyme action.

Q3. Answer B: Bile breaks large fat globules into smaller droplets, increasing surface area for enzyme action.

Q4. Answer B: Haemoglobin in red blood cells binds oxygen and transports it to tissues.

Q5. Answer B: Excretion removes wastes such as urea, carbon dioxide, and excess water from the body.

Q6. Answer B: Aerobic respiration releases energy from glucose and produces carbon dioxide and water.

Q7. Answer B: Reflex actions are usually coordinated through the spinal cord for a quick response.

Q8. Answer A: Roots grow in the direction of gravity, showing positive geotropism.

Q9. Answer A: The thyroid gland secretes thyroxine, which influences body metabolism.

Q10. Answer A: Sensory neurons transmit impulses from receptors to the brain or spinal cord.

Q11. Answer B: The medulla controls important involuntary functions such as breathing and heartbeat.

Q12. Answer A: Insulin helps cells take up glucose from the blood and supports storage of excess glucose.

Q13. Answer A: The stamen produces pollen grains and is the male reproductive part of a flower.

Q14. Answer A: After pollination, the pollen grain germinates and forms a pollen tube that carries male gametes toward the ovule.

Q15. Answer A: Fragmentation is an asexual method in which fragments of the parent grow into complete organisms.

Q16. Answer C: Sexual reproduction mixes genetic material from two parents, creating new genetic combinations.

Q17. Answer A: In humans, the sperm and egg usually fuse in the oviduct.

Q18. Answer A: After fertilisation, the ovule develops into a seed and the ovary develops into a fruit.

Q19. Answer A: Genes are segments of DNA that control traits and are passed from parents to offspring.

Q20. Answer B: A recessive trait is expressed when the genotype contains two recessive alleles.

Q21. Answer A: Grass is a green plant that makes food by photosynthesis, so it is the producer.

Q22. Answer B: A food web is a network of interlinked food chains showing multiple feeding relationships.

Q23. Answer C: Plastic bottles decompose very slowly and are generally treated as non-biodegradable waste.

Q24. Answer A: The ozone layer absorbs harmful UV radiation and protects living organisms.

Q25. Answer B: Reuse and recycling reduce the amount of waste sent to landfills and save resources.

Q26. Answer A: Rainwater harvesting stores runoff and allows water to percolate into the ground.

Q27. Answer A: Local communities often understand local resources and can support sustainable use and protection.

Q28. Answer A: Forests can regenerate if harvested and replanted responsibly; fossil fuels form over millions of years.

Q29. Answer B: Switching off unused devices reduces energy consumption and waste.

Q30. Answer A: Public transport and cycling can reduce fuel use and pollution.

Q31. Answer A: The blue-black colour indicates starch, which forms in the illuminated leaf through photosynthesis.

Q32. Answer A: Increased breathing and heartbeat supply oxygen and glucose to muscles for respiration and energy release.

Q33. Answer A: Auxin distribution causes unequal growth, bending the shoot toward light.

Q34. Answer A: Sexual reproduction produces new gene combinations, so siblings may differ.

Q35. Answer A: Persistent chemicals accumulate at higher trophic levels, especially in top consumers.

Q36. Answer A: Xylem conducts water upward, and transpiration pull is a major force supporting this movement.

Q37. Answer A: Insulin from the pancreas helps regulate glucose levels, explaining the assertion.

Q38. Answer A: Without gamete fusion, there is less genetic mixing, so offspring are usually similar to the parent.

Q39. Answer A: Decomposers return nutrients to the environment, supporting producers and ecosystem cycles.

Q40. Answer A: Sustainability prevents overuse and helps protect ecosystems for future generations.

Q41. Answer A: Closed stomata reduce carbon dioxide entry, limiting the raw material needed for photosynthesis.

Q42. Answer A: The cerebellum coordinates voluntary movements and balance.

Q43. Answer C: Tt × tt gives Tt and tt in equal proportion, so 50% are expected to be dwarf.

Q44. Answer A: Cuttings produce plants genetically similar to the parent, preserving desired characteristics.

Q45. Answer D: Energy decreases at each trophic transfer, so the top consumer generally has the least available energy.

Q46. Answer B: Alveoli are air sacs in the lungs where oxygen and carbon dioxide are exchanged.

Q47. Answer A: The left ventricle pumps oxygenated blood to the whole body, requiring greater force.

Q48. Answer A: A dominant allele can express the trait in heterozygous condition.

Q49. Answer A: Contour bunding slows runoff, and vegetation roots hold soil in place.

Q50. Answer A: Since energy transfer is inefficient, only limited energy is available for higher trophic levels.