Brainiacs Biology Olympiad Preliminary Round Sample Exam Paper 3

Category I – grades 7 and 8

Easy Questions (5 Questions)

Q1.

Biology is the study of living organisms and their interactions with the environment.
Scientists use specific steps to investigate and understand the natural world.
Indicate if each of the following is true or false:
A. The scientific method includes observation, hypothesis formation, and experimentation.
B. A hypothesis is a random guess about an observation.
C. Conclusions in biology are drawn after analyzing experimental results.
D. The scientific method is only used in biology.

Answers:
A. True
B. False
C. True
D. False

Q2.

Plant cells and animal cells are similar in some ways but have key differences. Structures like the cell wall and chloroplasts are unique to plant cells.
Indicate if each of the following is true or false:
A. Both plant and animal cells have mitochondria.
B. The cell wall in plant cells provides structural support.
C. Chloroplasts are found in animal cells to perform photosynthesis.
D. The nucleus is present in both plant and animal cells.

Answers:
A. True
B. True
C. False
D. True

Q3.

The respiratory system works with the circulatory system to deliver oxygen to body cells and remove carbon dioxide. The lungs play a crucial role in this process.
Indicate if each of the following is true or false:
A. Oxygen enters the blood through the alveoli in the lungs.
B. Carbon dioxide is transported only by red blood cells to the lungs for exhalation.
C. The diaphragm contracts to help the lungs expand during inhalation.
D. The circulatory system does not transport gases like oxygen and carbon dioxide.

Answers:
A. True
B. False

C. True
D. False

Q4.

Roots, stems, leaves, and flowers are the main structures of plants. Each of these parts has specific functions essential for plant survival.
Indicate if each of the following is true or false:
A. Roots absorb water and nutrients from the soil.
B. Leaves are the main site of photosynthesis in plants.
C. Stems transport food and water throughout the plant.
D. Flowers are primarily responsible for photosynthesis.

Answers:
A. True
B. True
C. True
D. False

Q5.

Food chains and food webs show how energy flows through ecosystems. Producers, consumers, and decomposers play specific roles in these systems.
Indicate if each of the following is true or false:
A. Producers create their own food using sunlight.
B. Consumers only eat producers for energy.
C. Decomposers break down dead organisms and recycle nutrients.
D. Food webs only show one specific pathway of energy flow.

Answers:
A. True
B. False
C. True
D. False

Normal Questions (10 Questions)

Q6.

Living organisms are organized into levels of complexity, starting with cells. Cells form tissues, tissues form organs, and organs form systems.
Indicate if each of the following is true or false:
A. Cells are the smallest unit of life.
B. Organs are made of multiple types of tissues.
C. Systems are groups of tissues that perform the same function.
D. The heart is an example of a system.

Answers:
A. True
B. True
C. False
D. False

Q7.

Producers, consumers, and decomposers interact to maintain balance in ecosystems. These roles are essential for energy flow and nutrient recycling.
Indicate if each of the following is true or false:
A. Producers are always at the top of the food chain.
B. Consumers rely on producers or other consumers for energy.
C. Decomposers help return nutrients to the soil.
D. Energy flows through ecosystems in many directions.

Answers:
A. False
B. True
C. True
D. False

Q8.

Photosynthesis converts light energy into chemical energy stored in glucose. This process is crucial for plant survival and oxygen production.
Indicate if each of the following is true or false:
A. Chloroplasts are responsible for photosynthesis in plant cells.
B. Oxygen is a waste product of photosynthesis.
C. Photosynthesis requires sunlight, water, and sugar.
D. Photosynthesis happens in the roots of plants.

Answers:
A. True
B. True
C. False
D. False

Q9.

The excretory system removes waste products from the body. Organs like the kidneys and bladder play a key role in this process.
Indicate if each of the following is true or false:
A. The kidneys filter waste products from the blood.
B. The bladder stores urine before it is excreted.
C. The liver produces bile as part of the excretory system.
D. Sweat glands help remove waste from the body.

Answers:
A. True
B. True
C. False
D. True

Q10.

Plant reproduction involves both sexual and asexual processes. Flowers play a key role in sexual reproduction, involving pollination and seed formation.
Indicate if each of the following is true or false:
A. Pollination occurs when pollen is transferred from the anther to the stigma.
B. Fertilization happens when pollen reaches the ovary.
C. Seeds are formed in the leaves of a plant.
D. Flowers attract pollinators, such as bees and butterflies.

Answers:
A. True
B. True
C. False
D. True

Q11.

The scientific method is a systematic approach used to investigate and understand the natural world. It involves forming hypotheses, conducting experiments, and analyzing results.
Indicate if each of the following is true or false:
A. A hypothesis is a testable prediction based on observations.
B. Scientific experiments must always support the hypothesis.
C. Data analysis is important for interpreting experimental results.
D. Conclusions are drawn after analyzing the results of an experiment.

Answers:
A. True
B. False
C. True
D. True

Q12.

Ecosystems are influenced by environmental factors like light, temperature, and water. These abiotic factors interact with living organisms to shape ecosystems.
Indicate if each of the following is true or false:
A. Light is an abiotic factor that affects plant growth.
B. Temperature only affects plants, not animals, in an ecosystem.
C. Water availability impacts both plants and animals.
D. Abiotic factors include non-living elements like soil and air.

Answers:
A. True
B. False
C. True
D. True

Q13.

The circulatory system works with other systems to maintain homeostasis. It transports nutrients, oxygen, and waste products throughout the body.
Indicate if each of the following is true or false:
A. Arteries carry blood away from the heart.
B. Veins carry oxygen-rich blood to the body.
C. Capillaries are where the exchange of gases and nutrients occurs.
D. The circulatory system includes the heart, blood vessels, and liver.

Answers:
A. True
B. False
C. True
D. False

Q14.

Levels of organization in living organisms range from cells to entire systems. Each level has a specific role in maintaining life.
Indicate if each of the following is true or false:
A. Organs are made of tissues working together to perform a function.
B. Systems are groups of cells performing similar roles.
C. Tissues are made of similar cells working together.
D. The heart is an example of an organ system.

Answers:
A. True
B. False
C. True
D. False

Q15.

Prokaryotic cells are simple, single-celled organisms without a nucleus. Eukaryotic cells, on the other hand, have a nucleus and more complex structures.
Indicate if each of the following is true or false:
A. Prokaryotic cells are smaller and simpler than eukaryotic cells.
B. Eukaryotic cells have organelles like the mitochondria and nucleus.
C. Both prokaryotic and eukaryotic cells can perform photosynthesis.
D. Prokaryotic cells store DNA in a nucleus.

Answers:
A. True
B. True
C. True
D. False

Hard Questions (5 Questions)

Q16.

Experiment:
A student conducted an experiment to measure the effect of water on seed germination. Three groups of seeds were prepared: Group 1 received no water, Group 2 received a small amount of water daily, and Group 3 was submerged in water. After two weeks, the student observed that Group 2 had the highest germination rate, while Group 1 did not germinate, and Group 3 showed some rotting.

Indicate if each of the following is true or false:
A. Water is essential for seed germination, but too much can harm the seeds.
B. Seeds in Group 1 could not germinate due to a lack of water.
C. Submerging seeds in water promotes the fastest germination.
D. The experiment shows that a balanced water supply is important for germination.

Answers:
A. True
B. True
C. False
D. True

Q17.

Scenario:
A student observed that plant leaves wilt during the day but recover at night. The student hypothesized that the plants were losing water through their leaves during the day due to higher temperatures and sunlight.

Indicate if each of the following is true or false:
A. The wilting is caused by the loss of water through transpiration.
B. Transpiration occurs more rapidly during the day due to higher temperatures.
C. Plants cannot recover from wilting even if they are watered.
D. Closing stomata during the day can increases water loss.

Answers:
A. True
B. True
C. False
D. False

Q18.

Experiment:
In an experiment, students placed an aquatic plant in a beaker of water with added sodium bicarbonate to provide carbon dioxide. They measured the rate of oxygen bubbles released under different light intensities. The results showed that oxygen production increased with light intensity up to a certain point, after which it levelled off.

Indicate if each of the following is true or false:
A. Photosynthesis increases with light intensity but has a saturation point.
B. The sodium bicarbonate provided carbon dioxide for photosynthesis.
C. The experiment proves that light intensity is the only factor affecting photosynthesis.
D. Oxygen bubbles indicate the rate of photosynthesis in the plant.

Answers:
A. True
B. True
C. False
D. True

Q19.

Scenario:
A student created a model ecosystem in a closed terrarium containing plants, soil, and a few insects. After a few weeks, the student observed that the insects became less active, and some died, even though the plants were healthy.

Indicate if each of the following is true or false:
A. The insects may have died due to a lack of oxygen at night when plants are not performing photosynthesis.
B. Plants provide oxygen during the day, but they also consume it during respiration at night.
C. The terrarium lacks decomposers, which may disrupt the ecosystem balance.
D. The model terrarium represents a balanced ecosystem under all conditions.

Answers:
A. True
B. True
C. True
D. False

Q20.

Experiment:
A student investigated how soil type affects plant growth. They planted the same species of seeds in three types of soil: sandy soil, clay soil, and loamy soil. After a month, the plants in loamy soil were the tallest and healthiest, while plants in sandy soil were smaller, and plants in clay soil showed stunted growth.

Indicate if each of the following is true or false:
A. Loamy soil provides the best balance of nutrients and water retention for plant growth.
B. Plants in sandy soil grew poorly because it retains too much water.

C. Clay soil can restrict root growth due to its compact structure.
D. The experiment suggests that soil type affects plant growth significantly.

Answers:
A. True
B. False
C. True
D. True