Brainiacs Biology Olympiad Preliminary Round Sample Exam Paper 2

Category I – grades 7 and 8

Easy Questions (5 Questions)

Q1.

Living organisms share certain characteristics that define them. They grow, reproduce, respond to stimuli, and require energy for survival.
Indicate if each of the following is true or false:
A. All living organisms can produce their own food.
B. Growth is one of the characteristics of living organisms.
C. Living organisms respond to changes in their environment.
D. Non-living things need energy to survive.

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

Q2.

Cells are the basic building blocks of life. Animal cells and plant cells share common features but also have unique structures that serve specific purposes.
Indicate if each of the following is true or false:
A. The nucleus controls cell activities in both plant and animal cells.
B. Chloroplasts are found in both plant and animal cells.
C. The cell membrane is responsible for regulating what enters and leaves the cell.
D. Mitochondria produce energy for the cell.

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

Q3.

The human digestive system breaks down food into nutrients that the body can absorb. This process involves organs like the stomach, intestines, and liver.
Indicate if each of the following is true or false:
A. The stomach is where most nutrients are absorbed.
B. Enzymes play a role in breaking down food into smaller molecules.
C. The small intestine absorbs nutrients from digested food.
D. The liver produces bile, which helps digest fats.

Answers:
A. False
B. True

C. True
D. True

Q4.

Photosynthesis is a process in plants that converts sunlight into food. It occurs in the chloroplasts of plant cells and produces glucose and oxygen.
Indicate if each of the following is true or false:
A. Photosynthesis requires sunlight, carbon dioxide, and water.
B. Oxygen is a byproduct of photosynthesis.
C. Chlorophyll absorbs sunlight for photosynthesis.
D. Photosynthesis occurs in the mitochondria.

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

Q5.

Ecosystems consist of interactions between living organisms and their environment. Producers like plants form the base of the food chain, while consumers and decomposers play other essential roles.
Indicate if each of the following is true or false:
A. Producers make their own food using sunlight.
B. Decomposers are organisms that recycle nutrients.
C. Consumers can be herbivores, carnivores, or omnivores.
D. An ecosystem is made up of only animals.

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

Normal Questions (10 Questions)

Q6.

Characteristics of living organisms include growth, reproduction, and the ability to respond to stimuli. These traits are common to all living things.
Indicate if each of the following is true or false:
A. All living organisms need to reproduce to survive.
B. Non-living things cannot grow or respond to stimuli.
C. Energy is essential for the survival of all living organisms.
D. Only plants can produce their own food.

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

Q7.

Cells are the basic building blocks of all living organisms. Each cell contains structures like the nucleus and mitochondria, which perform specific functions.
Indicate if each of the following is true or false:
A. The cytoplasm provides energy for the cell.
B. Mitochondria are responsible for energy production in the cell.
C. The cell membrane controls what enters and leaves the cell.
D. Plant cells have chloroplasts, which help them make food.

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

Q8.

Prokaryotic and eukaryotic cells differ in their structure and complexity. Prokaryotic cells lack a nucleus, while eukaryotic cells have one.
Indicate if each of the following is true or false:
A. Prokaryotic cells have no membrane-bound organelles.
B. Eukaryotic cells have a nucleus that stores genetic material.
C. Bacteria are examples of prokaryotic cells.
D. Both prokaryotic and eukaryotic cells have mitochondria.

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

Q9.

The human respiratory system allows for the exchange of gases between the body and the environment. Oxygen is absorbed into the blood in the lungs, and carbon dioxide is released.
Indicate if each of the following is true or false:
A. The lungs transfer oxygen to the blood through alveoli.
B. Carbon dioxide is a waste product exhaled by the respiratory system.
C. The heart is the main organ responsible for oxygen exchange.
D. The diaphragm plays a role in the process of breathing.

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

Q10.

Photosynthesis is a process that allows plants to make food using sunlight, carbon dioxide, and water. This process occurs in chloroplasts and produces glucose and oxygen.
Indicate if each of the following is true or false:
A. Photosynthesis requires sunlight to occur.
B. Carbon dioxide is absorbed by the roots for photosynthesis.
C. Glucose is the food produced by photosynthesis.
D. Oxygen is a byproduct of photosynthesis.

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

Q11.

The digestive system helps the body break down food into smaller components that can be absorbed into the bloodstream. Organs like the stomach, liver, and intestines play vital roles.
Indicate if each of the following is true or false:
A. The stomach breaks down food using acid and enzymes.
B. Nutrients are absorbed in the small intestine.
C. The liver produces bile to help digest fats.
D. The large intestine absorbs most of the food's nutrients.

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

Q12.

Plant reproduction involves processes like pollination, fertilization, and seed formation. Flowers play a crucial role in this process.
Indicate if each of the following is true or false:
A. Pollination is the transfer of pollen from the anther to the stigma.
B. Fertilization occurs when the pollen reaches the ovary.
C. The fruit is formed from the ovule after fertilization.
D. Seeds are formed in the stem of the plant.

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

Q13.

Ecosystems are made up of producers, consumers, and decomposers. These groups interact to form food chains and food webs.
Indicate if each of the following is true or false:
A. Producers, like plants, make their own food.
B. Consumers feed on producers or other consumers.
C. Decomposers recycle nutrients from dead organisms.
D. Food chains only include producers and consumers.

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

Q14.

The cell membrane is a key structure that controls what enters and leaves the cell. It helps maintain a stable environment within the cell.
Indicate if each of the following is true or false:
A. The cell membrane is selectively permeable.
B. Proteins in the cell membrane assist in transporting molecules.
C. Water cannot pass through the cell membrane.
D. The cell membrane helps the cell maintain homeostasis.

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

Q15.

Light, temperature, and water are important environmental factors that affect ecosystems. Organisms in an ecosystem depend on these factors for survival.
Indicate if each of the following is true or false:
A. Light is only important for plants in an ecosystem.
B. Temperature affects the activity and survival of organisms.
C. Water availability impacts the growth and reproduction of organisms.
D. Ecosystems can function without light, temperature, or water.

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

Hard Questions (5 Questions)

Q16.

Experiment:
A student studied the effect of light on photosynthesis in plants. The student placed a plant under three conditions for a week: (1) full sunlight, (2) partial shade, and (3) complete darkness. The growth of the plant and the number of leaves were measured. Results showed the plant in full sunlight grew tallest, while the plant in complete darkness showed yellowing leaves and no growth.

Indicate if each of the following is true or false:
A. The plant in complete darkness could not perform photosynthesis due to the absence of light.
B. Photosynthesis is the only process responsible for the growth observed in plants under full sunlight.
C. The yellowing of leaves in the dark is due to the breakdown of chlorophyll.
D. Plants in partial shade performed photosynthesis but at a reduced rate.

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

Q17.

Scenario:
In an experiment, a student observed that when potato slices were placed in saltwater, they shrank in size, while potato slices placed in distilled water swelled up. The student hypothesized that water moved into or out of the potato cells depending on the surrounding solution.

Indicate if each of the following is true or false:
A. The potato slices shrank in saltwater because water moved out of the cells by osmosis.
B. The potato slices in distilled water swelled due to water moving into the cells by osmosis.
C. Osmosis is the movement of water molecules from a higher concentration of solutes to a lower concentration of solutes across a selectively permeable membrane.
D. The experiment showed that saltwater has no effect on the size of potato cells.

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

Q18.

Experiment:
Students observed the effect of temperature on the activity of enzymes found in saliva. They placed starch solutions at three different temperatures (10°C, 37°C, and 70°C) and added saliva. The breakdown of starch was fastest at 37°C and slowest at 10°C. At 70°C, no starch was broken down.

Indicate if each of the following is true or false:
A. The enzyme in saliva works best at body temperature (37°C).
B. At 70°C, the enzyme was denatured and could not function.
C. Low temperatures completely stop enzyme activity.
D. The enzyme breaks down starch into glucose.

Answers:
A. True
B. True
C. False
D. False (It breaks down starch into maltose, not glucose.)

Q19.

Scenario:
A student created a model of an ecosystem in a closed terrarium with plants, soil, and insects. After several weeks, the plants were healthy, but the insects began to die. The student concluded that oxygen levels might be too low for the insects to survive.

Indicate if each of the following is true or false:
A. Plants produce oxygen during the day through photosynthesis.
B. The insects' death could be due to a lack of oxygen during the night when plants do not perform photosynthesis.
C. Plants can provide enough oxygen for the insects at all times.
D. The terrarium represents an example of an ecosystem.

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

Q20.

Experiment:
A student investigated the role of stomata in plant leaves. They placed Vaseline on the undersides of some leaves to block the stomata. Over a week, the leaves with Vaseline wilted, while the others remained healthy. The student concluded that stomata are essential for water regulation in plants.

Indicate if each of the following is true or false:
A. Stomata are involved in the exchange of gases like carbon dioxide and oxygen.

B. Blocking the stomata prevents water loss, which helps the plant remain hydrated.
C. The experiment shows that stomata are crucial for maintaining water balance in plants.
D. The leaves with Vaseline wilted because photosynthesis stopped completely.

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