FIRST TERM MODEL QUESTION PAPER 2024 WITH ANSWER KEY SET 1

BIOLOGY - Standard IX

Time: 1.5 hours

Max. Marks: 40

(Prepared by www.educationobserver.com)

---

1. 15 minutes is given as cool-off time.
2. This time is to be used for reading the question paper.
3. You are not supposed to write anything during the cool-off time.
4. Attempt the questions according to the instructions.

Section A: Multiple Choice Questions (MCQs) [1 mark each]

1. The movement of water molecules through a selectively permeable membrane is called: a) Diffusion
   b) Osmosis
   c) Active transport
   d) Facilitated diffusion
2. Which of the following is an example of a biomolecule? a) Oxygen
   b) Water
   c) Protein
   d) Sodium chloride
3. Photosynthesis primarily occurs in which part of the plant cell? a) Nucleus
   b) Chloroplast
   c) Mitochondria
   d) Cell membrane
4. The fluid surrounding cells in animals that maintains homeostasis is called: a) Cytoplasm
   b) Plasma membrane
   c) Extracellular fluid
   d) Nucleoplasm
5. Which of the following is a product of photosynthesis? a) Oxygen
   b) Carbon dioxide
   c) Nitrogen
   d) Methane

Section B: Short Answer Questions (Answer any 4 out of 5) [2 marks each]

1. Define homeostasis and explain its importance in living organisms.
2. What is osmosis? Give an example of how it occurs in plant cells.

3. Mention the role of chlorophyll in photosynthesis.
4. What are enzymes? Provide two examples and their functions.
5. Explain the difference between facilitated diffusion and active transport.

Section C: Descriptive Questions (Answer any 4 out of 5) [3 marks each]

1. Discuss the structure and functions of the plasma membrane with a labeled diagram.
2. Explain how nutrients from the environment are absorbed by plants and animals.
3. Describe the light and dark phases of photosynthesis and their importance.
4. How does diffusion differ from osmosis? Illustrate with examples.
5. Explain the significance of metabolic processes, differentiating between anabolism and catabolism.

Section D:

1. Draw and explain the structure of a chloroplast. How is it related to the process of photosynthesis?
2. An experiment involves placing raisins in freshwater and saltwater. Predict the observations and explain the underlying principles.
3. Explain the process of active transport with the help of a labeled diagram and state its role in maintaining cellular balance.
4. Describe an experiment to demonstrate osmosis using a plant cell (e.g., potato or onion peel).
5. Discuss how homeostasis is maintained in the human body with examples related to temperature and fluid balance.

Answer Key

Section A: MCQs

1. b) Osmosis
2. c) Protein
3. b) Chloroplast
4. c) Extracellular fluid
5. a) Oxygen

Section B: Short Answer Questions

1. Homeostasis is the maintenance of a stable internal environment in living organisms. It is crucial for proper cell function and overall health.
2. Osmosis is the movement of water molecules from a region of higher concentration to a region of lower concentration through a selectively permeable membrane. Example: Water uptake by plant roots.
3. Chlorophyll captures sunlight and converts it into chemical energy, driving the process of photosynthesis.
4. Enzymes are proteins that speed up chemical reactions. Examples: Salivary amylase breaks down starch, and pepsin digests proteins.
5. Facilitated diffusion allows substances to move across membranes without energy using protein channels, while active transport requires energy to move substances against a concentration gradient.

Section C: Descriptive Questions

1. The plasma membrane is composed of a phospholipid bilayer with embedded proteins. It regulates the entry and exit of substances, maintaining homeostasis.
2. Plants absorb nutrients through roots from soil, while animals absorb nutrients from food through the digestive system.
3. The light phase of photosynthesis occurs in the grana and involves the splitting of water to produce oxygen, while the dark phase occurs in the stroma, where glucose is synthesized.
4. Diffusion is the passive movement of molecules from higher to lower concentration (e.g., oxygen into cells), while osmosis specifically refers to water movement through a membrane.
5. Metabolism involves both anabolism (building molecules) and catabolism (breaking down molecules). An example of anabolism is protein synthesis, while respiration is an example of catabolism.

Section D:

1. (Include a labeled diagram of a chloroplast showing grana, thylakoids, and stroma.) Chloroplasts are the site of photosynthesis where light energy is converted into chemical energy.
2. In freshwater, raisins swell due to water absorption (endosmosis), while in saltwater, they shrink as water leaves the cells (exosmosis).
3. Active transport involves carrier proteins and energy from ATP to move ions across the membrane, maintaining cell concentration gradients.
4. (Describe using a potato/osmosis experiment setup with diagrams.) This experiment demonstrates osmosis as water moves in or out of plant cells based on the solution concentration.

5. Homeostasis in humans includes temperature regulation through sweating and shivering, and maintaining fluid balance by regulating water intake and urine output.