PRACTICE PAPER (2026–27)

Chapter 05: Life Processes

CLASS: X **SUBJECT: SCIENCE** **DURATION: 1½ hrs** **MAX. MARKS: 40**

General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five Sections: **A**, **B**, **C**, **D**, and **E**.
3. **Section A** comprises 10 Multiple Choice Questions (including Assertion-Reason) of 1 mark each.
4. **Section B** comprises 4 questions of 2 marks each.
5. **Section C** comprises 3 questions of 3 marks each.
6. **Section D** comprises 1 question of 5 marks (with internal choice).
7. **Section E** comprises 2 Case Study Based Questions of 4 marks each.
8. Use of calculators is strictly prohibited.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. The breakdown of pyruvate to give carbon dioxide, water, and energy takes place in:
   (a) Cytoplasm (b) Mitochondria
   (c) Chloroplast (d) Nucleus

2. During vigorous physical exercise, lack of oxygen in human muscle cells leads to the conversion of pyruvate into:
   (a) Ethanol and CO_2 (b) Lactic acid and energy
   (c) Glucose and energy (d) Pyruvate and water

3. Which of the following components of gastric juice prevents the inner mucosal lining of the stomach from the harmful action of hydrochloric acid?
   (a) Pepsin (b) Mucus
   (c) Salivary amylase (d) Bile salts

4. Opening and closing of stomatal pores is regulated by the:
   (a) Concentration of CO_2 in stomata (b) Temperature of the leaf
   (c) Water content in guard cells (d) Amount of light falling on chloroplasts

5. The correct pathway of blood circulation through the human heart is:
   (a) Left atrium → Left ventricle → Lungs → Right atrium (b) Right atrium → Right ventricle → Lungs → Left atrium → Left ventricle
   (c) Right atrium → Lungs → Left ventricle → Right ventricle (d) Left ventricle → Right ventricle → Lungs → Left atrium

6. Which region of the human alimentary canal absorbs the maximum amount of digested nutrients?
   (a) Stomach (b) Small intestine
   (c) Large intestine (d) Oesophagus

7. In human kidneys, the structural and functional filtration unit is called:
   (a) Ureter (b) Nephron
   (c) Neuron (d) Alveolus

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8. Which of the following blood vessels carries oxygenated blood from the lungs back to the left atrium of the heart?

(a) Pulmonary artery (b) Pulmonary vein

(c) Vena cava (d) Aorta

Directions for Q9 and Q10: In each question, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. Mark the correct choice as:

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

(c) (A) is true but (R) is false.

(d) (A) is false but (R) is true.

9. **Assertion (A):** The walls of the ventricles in the human heart are much thicker and more muscular than those of the atria.
   Reason (R): Ventricles have to pump blood with high pressure to various distant organs in the body.

10. **Assertion (A):** Rings of cartilage are present along the length of the human trachea.
    Reason (R): Cartilage rings ensure that the air passage does not collapse when there is less air in it.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. What are the two primary functions of bile juice in human digestion? Name the organ that secretes bile.

12. How are alveoli in human lungs structurally adapted to maximize the gaseous exchange?

13. Distinguish between the transport of substances in xylem and phloem tissue.

14. Why is the rate of breathing in aquatic organisms much faster than that seen in terrestrial organisms?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. State the three major sequential biochemical events that occur during the process of photosynthesis in green plants.

16. Explain the three distinct pathways of glucose breakdown:
    a. In the presence of oxygen (aerobic)
    b. In the absence of oxygen (anaerobic in yeast)
    c. In the lack of oxygen (in human muscle cells).

17. Give suitable biological reasons for each of the following observations:
    a. Veins have thin walls and possess one-way internal valves, whereas arteries have thick, elastic walls without valves.
    b. Herbivores have a significantly longer small intestine than carnivores.
    c. Desert plants take up carbon dioxide at night instead of during the daytime.

SECTION – D

Question 18 carries 5 marks.

18. a. What is meant by "double circulation" in human beings? Why is it physiologically necessary for birds and mammals?
    b. Draw a schematic flow diagram showing the systemic and pulmonary circulatory circuits of human blood.
    c. What is the function of blood platelets? What would happen if blood platelets were absent from human circulation?

OR

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a. Describe the mechanism of urine formation in the human kidney under the following three stages:
(i) Glomerular filtration
(ii) Tubular selective reabsorption
(iii) Tubular secretion.

b. Name two major nitrogenous excretory waste products removed from the blood by kidneys.

c. What is haemodialysis (artificial kidney)? How does it help a patient suffering from kidney failure?

SECTION – E (Case Study Based Questions)

Questions 19 and 20 carry 4 marks each.

19. **Read the passage given below and answer the questions that follow:**

> *Transpiration is the evaporative loss of water in the form of water vapour from the aerial surfaces of a plant, primarily through stomata in the leaves. Although more than 95% of water absorbed by roots is lost via transpiration, this process is essential for plant survival. The continuous evaporation of water molecules from mesophyll cells creates a negative suction pressure—called the transpiration pull—which lifts continuous columns of water and dissolved minerals from root xylem through stems to the tallest tree tops. Furthermore, transpiration provides an evaporative cooling mechanism that prevents leaves from overheating under direct sunlight.*

a. Name the specialized microscopic pores on leaves through which the major part of transpiration occurs. **[1 Mark]**

b. State two key physiological benefits of transpiration for tall vascular plants. **[1 Mark]**

c. A potted plant is kept inside a transparent polythene bag and placed under the sun for two hours.
(i) What visual observation is made on the inner walls of the polythene bag?
(ii) How does placing a vaseline coat on both surfaces of the leaves affect this observation? **[2 Marks]**

OR

c. Explain the mechanism of translocation of food synthesized in the leaves to other plant parts via phloem. Does this process require metabolic energy? Justify. **[2 Marks]**

20. **Read the passage given below and answer the questions that follow:**

> *The small intestine is the site of complete digestion of carbohydrates, proteins, and fats. It receives secretions from two large glands: the liver and the pancreas. Pancreatic juice contains several enzymes, including pancreatic amylase for digesting carbohydrates, trypsin for breaking down proteins, and lipase for hydrolyzing fats. However, these enzymes require an alkaline pH to function effectively. Acidic food (chyme) arriving from the stomach is neutralised by alkaline bile salts secreted by the liver, which also mechanically emulsify large lipid globules into small droplets to increase the available enzyme surface area.*

a. Name the specific protein-digesting enzyme secreted by the pancreas. **[1 Mark]**

b. What is emulsification of fats, and which chemical substance brings it about? **[1 Mark]**

c. How are the inner walls of the small intestine adapted to absorb digested food efficiently into the bloodstream? **[2 Marks]**

OR

c. What will happen if the stomach fails to secrete hydrochloric acid (HCl)? State two specific digestive impairments that would result. **[2 Marks]**

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