विद्या सर्वार्थि साधिका

ANANDALAYA

PERIODIC TEST -1

Class: X

Subject: Science (086) MM: 40

Date : 18-07-2025 Time: 1 Hr. 30 min.

General Instructions:

1. There are 17 questions in all. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
3. Section A consists of 8 multiple choice questions of 1 mark each, Section B consists of 2 very short questions of 2 marks each, Section C consists of 2 short answer type questions of 3 marks each, section D consists of 2 long answer questions of 5 marks each and Section E consists 3 source-based/case study-based questions of 4 marks each with sub-parts.

SECTION A

1. A ray of light does not suffer any deviation when it passes _____ of a lens. (1)
   (A) parallel to the principal axis (C) through the principal focus
   (B) through the optic centre (D) all of the above

2. The absolute refractive indices of glass and water are $\frac{3}{2}$ and $\frac{4}{3}$ respectively. The refractive index of water with respect to glass is _____. (1)
   (A) $\frac{8}{9}$ (B) $\frac{9}{8}$ (C) $\frac{12}{6}$ (D) $\frac{6}{12}$

3. Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is (1)
   (A) 2:1 (B) 1:1 (C) 4:1 (D) 1:2

4. Identify the correct statement about the following reaction: $2H_2S+SO_2 \longrightarrow 2H_2O+S$ (1)
   (A) SO_2 is oxidising agent and H_2S is reducing agent.
   (B) H_2S is reduced to sulphur.
   (C) H_2S is oxidising agent and SO_2 is reducing agent.
   (D) SO_2 is oxidised to sulphur.

5. Which of the following is most accurate about the transportation of food in plants? (1)
   (A) It occurs from roots to leaves.
   (B) It is a passive process requiring no energy.
   (C) It is driven by transpiration pull.
   (D) It is bidirectional and uses energy.

6. A plant is kept in a place where the temperature is high and humidity is very low. If its stomata remain open for a long time, what would be the most immediate effect on the plant? (1)
   (A) More carbon dioxide enters, increasing photosynthesis
   (B) More minerals are absorbed through the roots
   (C) Excess water loss through transpiration, causing wilting
   (D) Oxygen builds up inside, stopping photosynthesis

For question numbers 7 and 8, two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

(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 and R is also false.

7. (A): A ray of light incident on a rectangular glass slab immersed in any medium emerges parallel to itself. (1)
(R): The extent of bending of the ray of light at the opposite parallel faces of the rectangular glass slab is equal and opposite to each other.

8. (A): Corrosion of iron is commonly known as rusting. (1)
(R): Corrosion of iron occurs in presence of water and air.

SECTION B

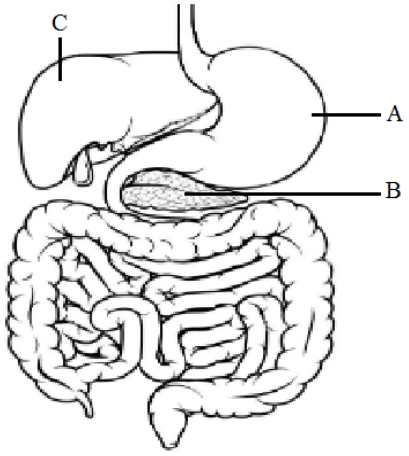
9. A lens produces a magnification of + 0.5. Is this a converging or diverging lens? Calculate the power of the given lens if its focal length is 10 cm. (2)

10. Write the balanced chemical equations for the following reactions and identify the type of reaction in each case. (2)
(a) In thermite reaction, iron (III) oxide reacts with aluminium and gives molten iron and aluminium oxide.
(b) Magnesium ribbon is burnt in an atmosphere of nitrogen gas to form solid magnesium nitride.

SECTION C

11. (a) Why are food items preferably packed in aluminium foil? (3)
(b) What is the difference between displacement and double displacement reactions? Write relevant equations for the above.

12. Analyse the given diagram of the human digestive system, where the following parts are labelled as A, B, and C. (3)



(a) Identify the parts labelled as A, B, and C.
(b) Name one digestive secretion released by each of these parts.
(c) Compare these digestive secretions in terms of their role in digestion.

SECTION D

13. (a) Write any two differences between aerobic and anaerobic respiration. (5)
(b) Schematically represent the pathway of air in human respiratory system from the nostrils to the alveoli of lungs.
(c) Why is the rate of respiration in plants generally much slower than in animals?

14. (a) Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray of light parallel to the principal axis of a convex mirror and show the angle of incidence and angle of reflection on it. (5)

(b) A 1.5 cm tall candle flame is placed perpendicular to the principal axis of a concave mirror of focal length 12 cm. If the distance of the flame from the pole of the mirror in 48 cm, use mirror formula to determine the position and size of the image formed.

SECTION E

Question numbers 15 to 17 are source-based/case study-based questions of 4 marks with sub-parts.

15. In our laboratories we use compound microscopes to see the magnified image of a microscopic object. A compound microscope is made up of two lenses. The lens nearest to the object to be viewed, called objective lens, forms real, inverted and magnified image of the object. This image serves as an object for the second lens called eyepiece. The eyepiece forms virtual, erect and magnified image of its object. Thus, the resultant image formed by a microscope is virtual and magnified with respect to the microscopic object viewed.

(i) The image of an object formed by a convex lens of focal length 2 cm is real, inverted and magnified. What is the range of object distance in this case? (1)

(ii) The image of an object formed by a convex lens of focal length 6 cm is virtual, erect and magnified. What is the range of object distance in this case? (1)

(iii) An object is placed at a distance of 12 cm from the optical centre of a convex lens of focal length 18 cm. Draw a labelled ray diagram to show the formation of image in this case. (2)

OR

(iii) The image formed by a convex lens is real, inverted and of the same size as the object. Identify the position of the object and draw a labelled ray diagram to show the formation of image in this case.

16. It is often seen that iron articles get rusted faster in rainy season than in dry weather. However silver articles turn black in air in any season and likewise aluminium articles lose their lustre and their surface becomes dull after sometime. Copper vessels get coated with a green layer. To protect iron from rusting iron sheets are coated with zinc.

(i) Why is rusting faster in the rainy season? (1)

(ii) Why silver articles turn black in air? (1)

(iii) Why copper gets coated with green layer? How can it be cleaned chemically? (2)

OR

(iii) What is galvanisation? Give two applications of galvanisation.

17. The human circulatory system is an intricate network responsible for transporting essential substances throughout the body. At its core lies the heart, a muscular organ that pumps blood continuously. Blood, the fluid connective tissue, comprises plasma and various blood cells. It travels through three main types of blood vessels: arteries, veins, and capillaries. Arteries carry oxygenated blood away from the heart to different organs, while veins bring deoxygenated blood back to the heart. Capillaries, being the thinnest, facilitate the exchange of nutrients, gases, and waste products between the blood and the body cells. This efficient system ensures that every cell receives the necessary supplies for its metabolic activities and that metabolic wastes are effectively removed for excretion.

(i) Why is blood described as a "fluid connective tissue"? (1)

(ii) Name the blood vessel that carries blood away from the human heart to various organs and also that carries blood towards the human heart. (1)

(iii) Explain the role of capillaries in the human circulatory system. (2)

OR

(iii) Differentiate between arteries and veins based on their structure and function.