



विद्या सर्वार्थ साधिका

ANANDALAYA PERIODIC TEST -1 Class: X

Subject: Science (086)

Date : 20-07-2024

MM : 40

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 questions of 2 marks each, Section C consists of 2 questions of 3 marks each, section D consists of 2 questions of 5 marks each and Section E consists 3 source-based/case study based questions of 4 marks each with sub-parts.

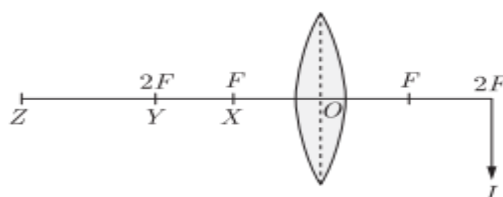
SECTION A

1. A student traces the path of a ray through a glass slab for different values of the angle of incidence ($\angle i$). He then measures the corresponding values of the angle of refraction ($\angle r$) and the angle of emergence ($\angle e$) for every value of the angle of incidence. On analysing these measurements of angles, his conclusion would be ____.

(A) $\angle i > \angle r = \angle e$ (B) $\angle i < \angle r = \angle e$ (C) $\angle i = \angle e > \angle r$ (D) $\angle i = \angle e < \angle r$

2. The position of an image (I) formed by a convex lens for an object is shown in the adjoining figure. In this case, the object should be kept ____.

(A) at Z
(B) at Y
(C) between Y and Z
(D) between X and Y



3. Observe the given figure carefully. Which of the following observation(s) is/are correct?

I. A thermal decomposition reaction takes place.
II. Red residue is left behind in the test tube.
III. Brown fumes of NO_2 are evolved.



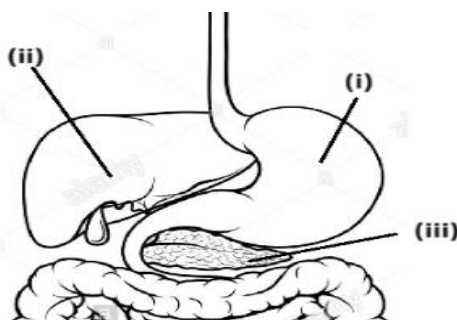
(A) I and II only (B) II and III only (C) I only (D) I and III only

4. The breakdown of pyruvate to liberate CO_2 , water and energy takes place in ____.

(A) Nucleus (B) Cytoplasm (C) Mitochondria (D) Endoplasmic Reticulum

5. In the human alimentary canal, the specific enzyme/ juice secreted in locations (i), (ii) and (iii) are ____.

(A) (i) Amylase (ii) Pepsin (iii) Bile
(B) (i) Pepsin (ii) Bile (iii) Trypsin
(C) (i) Lipase (ii) Amylase (iii) Pepsin
(D) (i) Trypsin (ii) Bile (iii) Amylase



6. Which of the following is a necessary condition for all chemical reactions? (1)
- (A) Reactants should be in the same state.
 - (B) Energy should be supplied to the reactants.
 - (C) Reactants should be at the same temperature.
 - (D) There should be physical contact between the reactants.

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. Assertion (A): A full length image of a tall building can be seen easily by using convex mirror. (1)
Reason (R): An image will be formed at infinity when an object is kept at the principal focus of a convex mirror.
8. Assertion (A): When we mix barium hydroxide solution with ammonium chloride, the bottom (1)
of the test tube becomes hot.
Reason (R): Heat is absorbed during a chemical reaction.

SECTION B

9. You have two lenses of focal length +20 cm and –20 cm. Which of the two lenses can form a (2)
virtual and magnified image of an object placed 15 cm from the lens? Draw a ray diagram to
justify your answer.
10. A solution of a substance 'X' is used for white washing. (2)
- (i) Name the substance 'X' and write its formula.
 - (ii) Write the reaction of the substance 'X' with water.

SECTION C

11. (a) Balance the following equation: $\text{Pb}(\text{NO}_3)_2 (\text{aq}) + \text{KI}(\text{aq}) \longrightarrow \text{PbI}_2 (\text{s}) + \text{KNO}_3 (\text{aq})$ (3)
(b) Tina finds a paper coated with a white substance in a chemistry lab. She keeps the paper
near the window of the laboratory and comes back to pick it up after five hours. She
noticed that the white substance had turned grey.
(I) What could be the most likely substance on the paper that Tina found?
(II) Write a chemical equation for this reaction.
12. Based on the experiment that proves 'light is essential for photosynthesis', answer the (3)
following:
- (a) Why was the potted plant kept in a dark room for 72 hours at the beginning of the
experiment?
 - (b) Explain the procedure of the starch test performed in the Biology laboratory to prove the
presence of starch in leaves.

SECTION D

13. (a) One half of a concave mirror of radius of curvature 20 cm is covered with a black paper. A (5)
candle flame is placed in front of the mirror at a distance of 15 cm. Will the mirror produce
a complete image of the flame on the screen? Draw ray diagram to justify your answer.
(b) An object is placed in front of a concave mirror of focal length 12 cm. The distance of the
object from the mirror is 18 cm. Calculate the distance of the image from the mirror and its
magnification.
14. (a) Draw a flow chart showing the three different respiratory pathways involved in the (5)
breakdown of glucose in different organisms.
(b) State scientific reason for the following statements:
- (i) Herbivores need a longer small intestine while carnivores have shorter small intestine.
 - (ii) The lungs are designed in human beings to maximise the area for the exchange of gases.

SECTION E

Questions 15 and 17 are Source-based/Case study based questions of 4 marks with sub-parts.

15. Refraction of light is due to change in the speed of light as it enters from one transparent medium to another. The ability of a medium to refract light is refractive index of the medium. It is also expressed in terms of its optical density. Optical density has a definite connotation. It is not the same as mass density. In comparing any two media, the one with the larger refractive index is optically denser medium than the other. The other medium of lower refractive index is optically rarer. The speed of light is higher in a rarer medium than a denser medium. Answer the following questions based on refractive index of the medium.

- (i) Define absolute refractive index of a medium. (1)
(ii) A ray of light travelling in air enters obliquely into water. Does the light ray bend towards the normal or away from the normal? Why? (1)
(iii) The absolute refractive index of two media 'A' and 'B' are 2.0 and 1.5 respectively. If the speed of light in medium 'B' is 2×10^8 m/s, calculate the speed of light in medium 'A'. (2)

OR

- (iii) The refractive index of medium 'X' with respect to medium 'Y' is $2/3$ and refractive index of medium 'Y' with respect to medium 'Z' is $4/3$. Find the refractive index of medium 'Z' with respect to medium 'X'.

16. Two students decided to investigate the effect of water and air on iron object under identical experimental conditions. They measured the mass of each object before placing it partially immersed in 10 ml of water. After a few days, the objects were removed, dried and their masses were measured. The table shows their results.

Student	Object	Mass of Object before Rusting in g	Mass of the coated object in g
A	Nail	3.0	3.15
B	Thin plate	6.0	6.33

- (i) What might be the reason for the varied observations of the two students? (1)
(ii) Does the rusting of iron take place in distilled water? (1)
(iii) In another set up the students coated iron nails with zinc metal and noted that, iron nails coated with zinc prevents rusting. They also observed that zinc initially acts as a physical barrier, but an extra advantage of using zinc is that it continues to prevent rusting even if the layer of zinc is damaged. Name this process of rust prevention and give any two other methods to prevent rusting. (2)

OR

- (iii) What is rancidity? Mention any two ways by which rancidity can be prevented.

17. Amoeba is an irregularly shaped animal with no fixed shape that ingests food particles by the formation of temporary finger-like projections. The food vacuole inside the amoeba breaks the food into small and soluble molecules. The digested food is thrown out from the amoeba by the rupture of the cell membrane and it goes on to the search of the next food particle.

- (i) Which is the correct statement about amoeba? (1)
(A) Unicellular; Prokaryotic; Protozoan (C) Multicellular; Protistan; Eukaryotic
(B) Eukaryotic; Unicellular; Protozoan (D) Eukaryotic; Multicellular; Protozoan
(ii) Which mode of nutrition is exhibited by amoeba? (1)
(A) Parasitic (B) Holozoic (C) Saprotrophic (D) Chemoautotrophic
(iii) How does absorption of digested food occur in amoeba? Support your answer with the diagram. (2)

OR

- (iii) Draw the diagram and explain the process of digestion in amoeba.