

NEW STANDARD ACADEMY

Date : 03-10-25

CLASS : 10TH SCIENCE

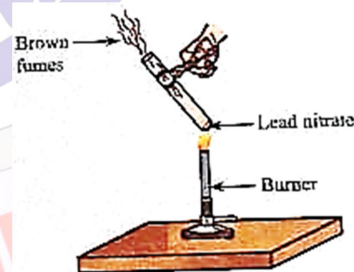
Marks: 80
Time: 3 hours.

Section A

- When an object was kept at position X in front of a concave mirror, an enlarged and virtual image was formed.
Which among the following identifies 'X' correctly?
(a) anywhere between the centre of curvature and principal focus
(b) anywhere between the pole and principal focus
(c) exactly at the centre of curvature
(d) exactly at the principal focus
- Riya was playing with her cat in her room when she noticed that the cat was fascinated by a spot of light moving on the wall. She realized that the spot of light was created by a small mirror directing sunlight into the room. What scientific concept is Riya observing?
(a) Refraction of light
(b) Dispersion of light
(c) Reflection of light
(d) Diffraction of light
- An object is placed at a distance of 10 cm in front of a plane mirror, then the distance of image from mirror will be
(a) 5 cm
(b) 10 cm
(c) 20 cm
(d) 0
- The angle of incidence for a ray of light having zero reflection angle is
(a) 30°
(b) 45°
(c) 0
(d) 60°
- $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$
The above reaction is an example of a
(a) combination reaction.
(b) double displacement reaction
(c) decomposition reaction
(d) displacement reaction
- Three beakers labelled as A, B and C each containing 25 ml. of water were taken. A small amount of NaOH, anhydrous CuSO_4 ,

and NaCl were added to the beakers A, B and C respectively. It was observed that there was an increase in the temperature of the solutions contained in beakers A and B, whereas in case of beaker C, the temperature of the solution falls. Which one of the following statement(s) is (are) correct?

- In beakers A and B, exothermic process has occurred.
 - In beakers A and B, endothermic process has occurred.
 - In beaker C exothermic process has occurred.
 - In beaker C endothermic process has occurred.
- (a) (i) only
(b) (ii) only
(c) (i) and (iv)
(d) (ii) and (iii)
- When 50g of lead powder is added to 300 ml of blue copper sulphate solution, after a few hours, the solution becomes colourless. This is an example of
(a) Combination reaction
(b) Decomposition reaction
(c) Displacement reaction
(d) Double displacement reaction
 - The emission of brown fumes in the given experimental set-up is due to



- thermal decomposition of lead nitrate which produce brown fumes of nitrogen dioxide.
- thermal decomposition of lead nitrate which produces brown fumes of lead oxide.

- (c) oxidation of lead nitrate forming lead oxide and nitrous dioxide.
 (d) oxidation of lead nitrate forming lead oxide and oxygen,

9. Identify the two components of phloem tissue that help in transportation of food in plants.
 (a) Phloem parenchyma & sieve tubes.
 (b) Sieve tubes & companion cells
 (c) Phloem parenchyma & companion cells
 (d) Phloem fibres and sieve tubes
10. Which is the correct sequence of parts in human alimentary canal?
 (a) Mouth → stomach → small intestine → oesophagus → large intestine
 (b) Mouth → oesophagus → small intestine → stomach → large intestine → large intestine
 (c) Mouth → stomach → oesophagus → small intestine → large intestine
 (d) Mouth → oesophagus → stomach → small intestine → large intestine

Assertion and Reason

Direction: The following questions consist of two statements - Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option 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, but R is true.
11. Assertion (A): The food coming from the stomach into the small intestine is acidic.
 Reason (R): The acidic nature of the food is neutralized by bile juice from the pancreas to facilitate the action of pancreatic enzymes.
12. Assertion (A): Carbohydrate digestion mainly takes place in small intestine.
 Reason (R): Pancreatic juice contains the enzyme lactose.
13. Assertion (A): In the given reaction,
 $\text{Zn(s)} + \text{CuSO}_4(\text{aq}) \rightarrow \text{ZnSO}_4(\text{aq}) + \text{Cu(s)}$
 Zn acts as a reductant but itself gets reduced.

Reason (R): In a redox reaction, oxidant gets reduced by accepting electrons and reductant gets oxidized by losing electrons

14. Assertion (A): The colour of aqueous solution of copper sulphate turns colourless when a piece of lead is added to it.
 Reason (R): Lead is more reactive than copper, and hence displaces copper from its salt solution.
15. Assertion (A): A convex mirror always forms an image behind it and the image formed is virtual.
 Reason (R): According to the sign convention, the focal length of a convex mirror is positive.
16. Assertion (A): The image formed by a concave mirror is certainly real if the object is virtual.
 Reason (R): The image formed by a concave mirror is certainly virtual if the object is real.

Section B

Subjective Questions

Very Short Answer Type Questions

17. Search mirrors are mirrors that are used to look for hidden objects underneath the cars as shown. The hidden objects can be easily spotted as the mirror provides a wider field of view.



- (a) What type of mirrors are generally used to make search mirrors?
 (b) With the help of a ray diagram describe the nature of image formed by the type of mirror identified in (a).
18. Define the terms: a ray of light and a beam of light.
19. Write an observation which illustrates that light travels in a straight line.
20. While getting ready in the morning, Anu uses a large wall-mounted mirror in her bathroom to check her appearance. She notices that her reflection is exactly the

same size as she is, upright, and appears to be the same distance behind the mirror as she is in front of it.

What type of mirror is Anu using, and what are the properties of the image she sees?

21. For what position of an object, a Real image equal to the size of the object is formed in front of the concave mirror. what would be the magnification in this case?
22. While cooking in an aluminium vessel, Sudeshna burned some food till all that was left was a completely charred and black residue. She just left the blackened vessel heating on the stove. After an hour she found that the vessel was completely clean, with no trace of any blackness.
 - (a) Write a chemical equation to explain what happened to the charred, black residue that made it disappear.
 - (b) Name the type of reaction referred to in (a).
23. A solution of a substance 'X' is used for white washing.
 - (i) Name the substance 'X' and write its formula.
 - (ii) Write the reaction of the substance 'X' named in (i) above with water
24. Answer the following questions:
 - (a) Write the balanced chemical equation of any one reaction that cannot be classified as combination, decomposition, simple displacement or double displacement.
 - (b) Examine the following reaction:

$$\text{Fe(s)} + 2\text{HCl(aq)} \rightarrow \text{FeH}_2\text{(aq)} + \text{Cl}_2\text{(g)}$$
 What changes are needed in the equation above to correctly represent the reaction between iron (Fe) and hydrochloric acid (HCl)?
25. What is observed when a solution of sodium sulphate is added to a solution of barium chloride taken in a test tube? Write equation for the chemical reaction involved and name the type of reaction in this case..

26. Decomposition reactions require energy either in the form of heat or light or electricity for breaking down the reactants. Write one equation each for decomposition reactions where energy is supplied in the form of heat, light and electricity.

27. (a) If you were a herbivore, what would you expect the length of your small intestine to be?
 (b) Do you think the coiling of the small intestine has any significance in the digestion process? Explain your answer.
28. Amit placed plant X in a glass jar with mice and plant Y in a separate jar without mice, both under the same light conditions. Which plant is more likely to photosynthesize more, and what is the reason behind it?
29. Two green plants are kept separately in oxygen free containers, one in the dark and other in sunlight. It was observed that plant kept in dark could not survive longer. Give reason for this observation.

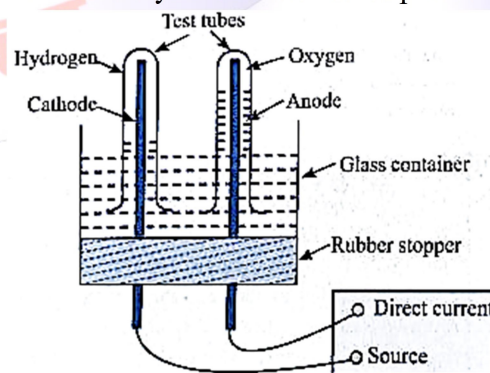
Section C

30. (i) What is the internal energy reserve in plants and animals?
 (ii) How desert plants perform photosynthesis if their stomata remain closed during the day?

OR

Name the site where carbohydrates, proteins, and fats are completely digested in humans, and specify which part of the body secretes the enzymes necessary for this digestion.

31. The diagram below shows the set-up in which electrolysis of water takes place.

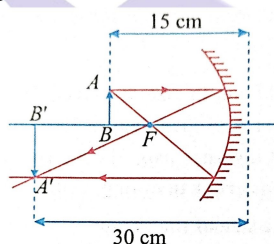


- a. What type of reaction takes place?

- b. Explain why this is an example of an endothermic reaction?
- c. The test tube containing hydrogen is removed carefully from the apparatus. A lit match stick is brought near the mouth of this test tube. The gas burns with an explosive "pop" sound.

Write a balanced chemical equation for this and indicate whether energy is absorbed or released

32. (a) State any two observations when an electric current is passed through acidulated water, in a container having each electrode covered by test tubes filled with water.
(b) Write the ratio of the mass of the gas collected at the cathode to the mass of the gas collected at the anode.
33. If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it? Draw a labelled ray diagram to support your answer.
34. An object of height 3 cm is placed on the principal axis of a concave mirror. The distance of the object from the mirror is 15 cm, and the image formed is 30 cm away from the mirror on the same side of the mirror as the object. Calculate the height of the image formed.



35. (i) A concave mirror of focal length 10 cm can produce a magnified real as well as virtual image of an object placed in front of it. Draw ray diagrams to justify this statement.
(ii) An object is placed perpendicular to the principal axis of a convex mirror of focal length 10 cm. The distance of the object from the pole of the mirror is 10 cm. Find the position of the image formed.

36. (a) If the image formed by a mirror for all positions of the object placed in front of it is always diminished, erect and virtual, state the type of the mirror and also draw a ray diagram to justify your answer. Write one use such mirrors are put to and why.
(b) Define the radius of curvature of spherical mirrors. Find the nature and focal length of a spherical mirror whose radius of curvature is + 24 cm
37. Which among the following changes are exothermic or endothermic in nature?
(a) Decomposition of ferrous sulphate
(b) Dilution of sulphuric acid
(c) Dissolution of sodium hydroxide in water
(d) Dissolution of ammonium chloride in water
(e) Formation of ammonia gas
38. (a) Compare the feeding mechanisms of Amoeba and Paramecium, highlighting their differences and similarities.
(b) After digestion, how are the simpler substances obtained from the food distributed within the Amoeba cell?
(c) How does the specialized feeding process in Paramecium contribute to its overall survival and functioning as a unicellular organism?
39. (a) Draw the diagram of alimentary canal and label the following parts: Mouth, Oesophagus, Stomach, Intestine
(b) Name the longest part of the alimentary canal.