

# Sample Paper

# 10

Time : 90 Minutes

Max. Marks : 40

## General Instructions

1. The Question Paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

## SECTION-A

Section – A consists of 24 questions. Attempt **any 20** questions from this section. The first attempted 20 questions would be evaluated.

1. A substance A reacts with another substance B to produce the product C and a gas D. If a mixture of the gas D and ammonia is passed through an aqueous solution of C, baking soda is formed. The substances A and B are  
(a) HCl and NaOH      (b) HCl and  $\text{Na}_2\text{CO}_3$       (c) Na and HCl      (d)  $\text{Na}_2\text{CO}_3$  and  $\text{H}_2\text{O}$
2. An element X reacts with dilute  $\text{H}_2\text{SO}_4$  as well as with NaOH to produce salt and  $\text{H}_2(\text{g})$ . Hence, it may be concluded that:  
I. X is an electropositive element.  
II. oxide of X is basic in nature.  
III. oxide of X is acidic in nature.  
IV. X is an electronegative element.  
(a) I, II, III      (b) IV, I, II      (c) III, IV, I      (d) II, III, IV
3. Four students studied reactions of Zinc and  $\text{Na}_2\text{CO}_3$  with dil HCl and dil NaOH solution and presented their result as follows. The '✓' represents evolution of a gas where as 'x' represents no reaction.

	Zn	$\text{Na}_2\text{CO}_3$
HCl	✓	✓
NaOH	✓	x

(A)

	Zn	$\text{Na}_2\text{CO}_3$
HCl	✓	x
NaOH	✓	✓

(B)

	Zn	$\text{Na}_2\text{CO}_3$
HCl	x	x
NaOH	✓	✓

(C)

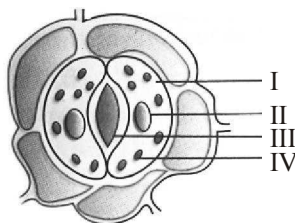
	Zn	$\text{Na}_2\text{CO}_3$
HCl	✓	✓
NaOH	x	x

(D)

The right set of observation is that of student

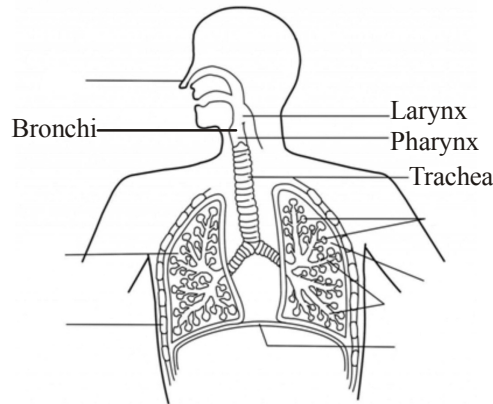
- (a) A      (b) B      (c) C      (d) D
4. Complete the missing components/variables given as  $x$  and  $y$  in the following reactions  
 $\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{KI}(\text{aq}) \rightarrow \text{PbI}_2(x) + \text{KNO}_3(y)$   
(a) s, s      (b) s, aq      (c) aq, aq      (d) aq, s
5. Which of the following does not corrode when exposed to the atmosphere?  
(a) Iron      (b) Copper      (c) Gold      (d) Silver

6. An element X (atomic number 12) reacts with another element Y (atomic number 17) to form a compound Z. Which of the following statements are true regarding this compound?
- Molecular formula of Z is  $XY_2$ .
  - It is soluble in water.
  - X and Y are joined by sharing of electrons.
  - It would conduct electricity in the molten state.
- (a) (ii) and (iii)                      (b) (i) and (iii)                      (c) (i), (iii) and (iv)                      (d) (i) and (iv)
7. In the reaction,  $N_2O_5 \longrightarrow NO_2 + O_2$   
how many moles of  $NO_2$  is produced when 2 moles of  $N_2O_5$  are dissociated?
- (a) 1                      (b) 2                      (c) 3                      (d) 4
8. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?
- (a) Lemon juice                      (b) Vinegar                      (c) Common salt                      (d) An antacid
9. 2 mL each of concentrated HCl,  $HNO_3$  and a mixture concentrated HCl and concentrated  $HNO_3$  in the ratio of 3 : 1 were taken in test tubes labelled as A, B and C. A small piece of metal was put in each test tube. No change occurred in test tubes A and B but the metal got dissolved in test tube C respectively. The metal could be
- (a) Al                      (b) Au                      (c) Cu                      (d) Pt
10. On the basis of following features, identify the correct option.
- This reaction occurs during corrosion.
  - This reaction occurs during respiration.
- (a) Decomposition reaction                      (b) Redox reaction  
(c) Combination reaction                      (d) Endothermic reaction
11. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in saliva?
- starch breaking down into sugar
  - Protein breaking down into amino acid
  - Absorption of vitamin
  - fats breaking down into fatty acids and glycerol.
12. In order to complete the diagram of stomatal apparatus given below, nuclei should be drawn parts, marked : –



- (a) (I) and (II)                      (b) (II) and (III)                      (c) (III) and (IV)                      (d) Only (II)
13. Photosynthesis is the transformation of
- light energy into chemical energy
  - Chemical energy into light energy
  - Solar energy into kinetic energy
  - Kinetic energy into Potential energy

14. Identify the correct labelled part with its function



**Column A**

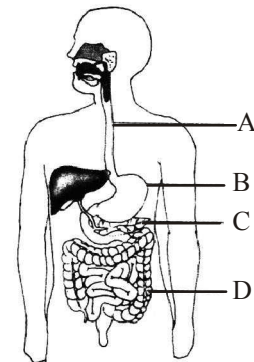
- (a) Pharynx
- (b) Trachea
- (c) Bronchi
- (d) Larynx

**Column B**

- Common passage for both food and air
- Tube like structure within the neck and upper chest
- Moisten the air
- Composed of cartilage, muscles and a mucosal surface

15. From the given picture of the digestive system, identify the part labelled as gastric gland.

- (a) A
- (b) B
- (c) C
- (d) D



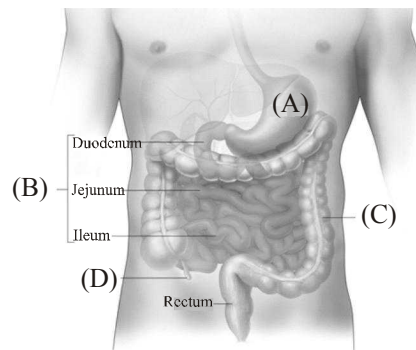
16. From the given picture of the digestive system match the correct labelled part with its function.

**Column I**

- (A) Stomach
- (B) Large intestine
- (C) Small intestine
- (D) Appendix

**Column II**

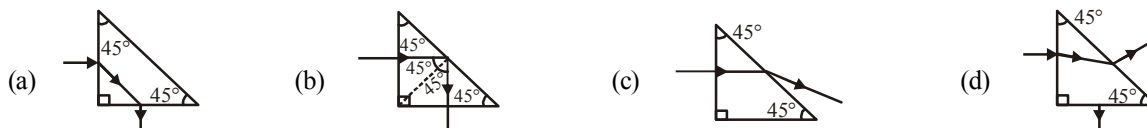
- (p) The structure is the site where the chemical breakdown of proteins first occurs.
- (q) This organ absorbs most of the water from the undigested food.
- (r) This organ is the section of the alimentary canal where most of the food is absorbed into the blood.
- (s) narrow finger-like tubular projections, is a vestigial organ



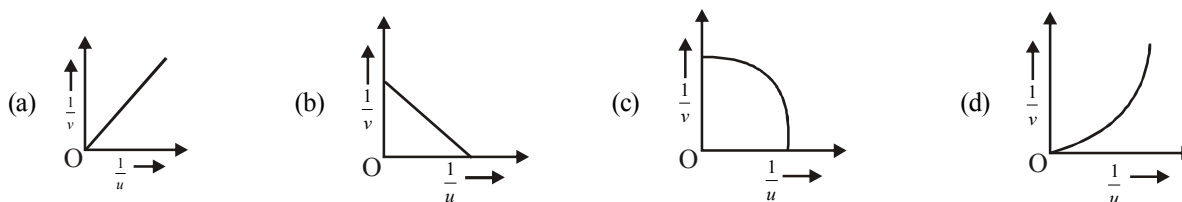
- (a) A-q, B-r, C-p, D-s
- (b) A-r, B-q, C-p, D-s
- (c) A-p, B-q, C-r, D-s
- (d) A-s, B-q, C-r, D-p

17. The relation between  $u$ ,  $v$  and  $R$  for a spherical mirror is
- (a)  $R = \frac{2uv}{u+v}$       (b)  $R = \frac{2}{u+v}$       (c)  $R = \frac{2(u+v)}{uv}$       (d) None of these

18. Which one of the following represents correct path a ray of light through a glass prism?



19. Which of the following correctly represents the variation of  $1/\mu$  versus  $1/v$  for a concave mirror?



20. A swimming pool looks shallower than it really is, when seen by a person standing outside near it, because of the phenomenon of
- (a) refraction of light      (b) reflection of light      (c) dispersion of light      (d) None of these
21. An object placed at  $2F$  of a convex lens will produce an image
- (a) at  $2F$       (b) same size      (c) real and inverted      (d) All of these
22. Refractive index of a substance is
- (a) speed of light in vacuum / speed of light in the medium  
 (b) speed of light in water / speed of light in the medium  
 (c) speed of light in the medium / speed of light in air  
 (d) All of these
23. Negative value of focal length of a spherical mirror indicates that it is
- (a) Concave mirror      (b) Convex mirror      (c) Plane mirror      (d) None of these
24. An air bubble in water will act like a :
- (a) Convex Mirror      (b) Concave Mirror      (c) Convex lens      (d) Concave lens

### SECTION-B

Section – B consists of 24 questions (Sl. No.25 to 48). Attempt **any 20** questions from this section. The first attempted 20 questions would be evaluated.

25. An aqueous solution 'A' turns phenolphthalein solution pink. On addition of an aqueous solution 'B' to 'A', the pink colour disappears. The following statement is true for solution 'A' and 'B'.
- (a) A is strongly basic and B is a weak base.      (b) A is strongly acidic and B is a weak acid.  
 (c) A has pH greater than 7 and B has pH less than 7.      (d) A has pH less than 7 and B has pH greater than 7.
26. A silvery white metal X reacts with water at room temperature to produce a water soluble compound Y and a colourless gas Z. The reaction is highly exothermic and the Z catches fire immediately during the reaction. The solution of Y in water on reacting with stoichiometric amount of dilute solution of hydrochloric acid gives a solution of  $\text{pH} = 7.0$ . The compounds X, Y and Z respectively are :
- (a) Al,  $\text{Al}(\text{OH})_3$  and  $\text{H}_2$       (b) Ag, AgOH and  $\text{H}_2$       (c) K, KCl and  $\text{H}_2$       (d) Na, NaOH and  $\text{H}_2$

27. In a balance equation  $\text{H}_2\text{SO}_4 + x\text{HI} \rightarrow \text{H}_2\text{S} + y\text{I}_2 + z\text{H}_2\text{O}$ , the values of  $x, y, z$  are—  
(a)  $x=3, y=5, z=2$       (b)  $x=4, y=8, z=5$       (c)  $x=8, y=4, z=4$       (d)  $x=5, y=3, z=4$
28. Equal lengths of magnesium ribbons are taken in test tube A and B. Hydrochloric acid (HCl) is added to test tube A while acetic acid ( $\text{CH}_3\text{COOH}$ ) is added to test tube B. In which case fizzing occurs more vigorously and why?  
(a) A      (b) B      (c) both (a) and (b)      (d) can't predicted
29. Aqueous solution of  $\text{CsO}_2$  is :  
(a) Basic      (b) Neutral      (c) Acidic      (d) Amphoteric
30. Aluminium does not oxidise readily in air because —  
(a) it is high in the electrochemical series.  
(b) it is low in the electrochemical series.  
(c) the metal does not combine with oxygen  
(d) the metal is covered with a layer of oxide which does not rub off.

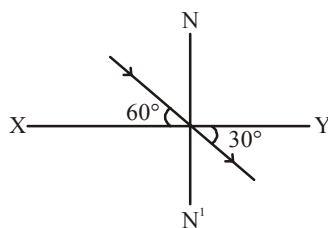
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Question No. 31 to 35 consist of two statements—Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A.  
(b) Both A and R are true and R is not the correct explanation of A.  
(c) A is true but R is false.  
(d) A is false but R is true.
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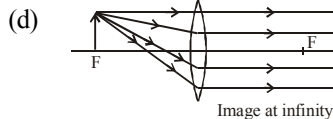
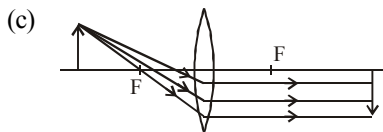
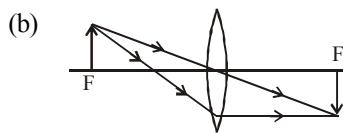
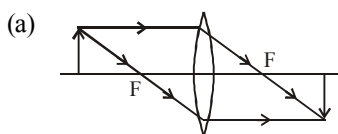
31. **Assertion** : Salts are the products of an acid-base reaction.  
**Reason** : Salt may be acidic or basic.
32. **Assertion** : Iron is found in the free state in nature.  
**Reason** : Iron is highly reactive element.
33. **Assertion** – The large intestine absorbs water from the food and stores faeces until it can be egested.  
**Reason** - Faeces is stored in rectum for a certain time and then eliminated from the body by peristaltic movement through the anus.
34. **Assertion** : There exists two angles of incidence for the same magnitude of deviation (except minimum deviation) by a prism kept in air.  
**Reason** : In a prism kept in air, a ray is incident on first surface and emerges out of second surface. Now if another ray is incident on second surface (of prism) along the previous emergent ray, then this ray emerges out of first surface along the previous incident ray. This principle is called principle of reversibility of light.
35. **Assertion** : Decomposition of vegetable matter into compost is an endothermic reaction.  
**Reason** : Heat is required in an endothermic reaction.
36. Which of these juices is secreted by Pancreas?  
(a) Trypsin, Renin      (b) Trypsin, Pepsin      (c) Pepsin, Ptyalin      (d) None of the above
37. Villi present on the inner lining of the intestinal wall  
(a) Secrete enzymes for digestion      (b) Secrete hormones  
(c) Decreases the surface area for absorption      (d) increases the surface area for absorption
38. Which of the following is incorrect statement regarding Heterotrophs?  
(a) Heterotrophs synthesise their own food.  
(b) Heterotrophs depend on other organisms for their food  
(c) Heterotrophs use organic substrates to get their carbon for growth & development.  
(d) Heterotrophs move from one place to another.

39. In figure a ray of light undergoes refraction from medium A to medium B. If the speed of light in medium A is  $v$  then the speed of light in medium B will be



- (a)  $\sqrt{3}v$                       (b)  $\frac{v}{\sqrt{3}}$                       (c)  $2v$                       (d)  $\frac{v}{2}$

40. Which of the following ray diagram is correct?



41. Which of the following group of organisms respire through skin

- (a) Earthworm, Frog, Birds                      (b) Insects, Molluscs, Fishes  
(c) Leech, Amphibians, Reptiles                      (d) Earthworm, Leech, Frog

42. During inhalation, air passes through

- (a) Larynx → nasal cavity → pharynx → trachea  
(b) Pharynx → nasal cavity → Larynx → Trachea → Bronchi → Bronchioles.  
(c) Nasal cavity → Pharynx → Larynx → Trachea → Bronchi → Bronchioles.  
(d) Larynx → Pharynx → Trachea → Lungs

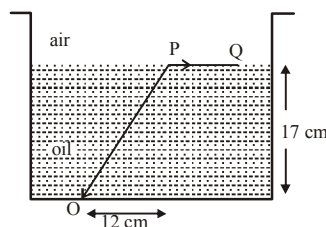
43. A convex mirror used for rear-view on an automobile has a radius of curvature of 3.00 m. If a bus is located at 5.00 m from this mirror, the position of image is

- (a) 0.5m                      (b) 1m                      (c) 1.15 m                      (d) 1.5m

44. A ray of light is incident in medium 1 on a surface that separates medium 1 from medium 2. Let  $v_1$  and  $v_2$  represent the velocity of light in medium 1 and medium 2 respectively. Also let  $n_{12}$  and  $n_{21}$  represent the refractive index of medium 1 with respect to medium 2 and refractive index of medium 2 with respect to medium 1, respectively. If  $i$  and  $r$  denote the angle of incidence and angle of refraction, then-

- (a)  $\frac{\sin i}{\sin r} = n_{21} = \frac{v_1}{v_2}$                       (b)  $\frac{\sin i}{\sin r} = n_{21} = \frac{v_2}{v_1}$                       (c)  $\frac{\sin i}{\sin r} = n_{12} = \frac{v_1}{v_2}$                       (d)  $\frac{\sin i}{\sin r} = n_{12} = \frac{v_2}{v_1}$

45. A vessel is filled with oil as shown in the diagram. A ray of light from point O at the bottom of vessel is incident on the oil-air interface at point P and grazes the surface along PQ. The refractive index of the oil is close to \_\_\_\_\_



- (a) 1.41                      (b) 1.50                      (c) 1.63                      (d) 1.73
46. Which of the following is false?
- (a) Convex lens always forms image with  $m < 1$   
 (b) A simple mirror produces virtual, erect and same-sized image  
 (c) A concave mirror produces virtual, erect and magnified image  
 (d) A convex lens can produce real and same-sized image
47. Consider the following statements:  
 (A) The sun looks red at sunset because most of the blue light in sunrays is scattered leaving behind red and yellow lights.  
 (B) Clouds look white because water droplets of clouds scatter all colours of light equally.  
 Which of these statement(s) is/are correct?
- (a) (A) only                      (b) (B) only                      (c) Both (A) and (B)                      (d) Neither (A) nor (B)
48. Which of the following is correctly matched

	pH	Nature
(a)	4	Acidic
(b)	2	Acidic
(c)	12	Alkaline
(d)	7	Weakly alkaline

### SECTION-C

Section – C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section. The first attempted 10 questions would be evaluated.

#### Case -I

Some metals are chemically very reactive, whereas others are less reactive or unreactive. On the basis of vigourness of reactions of various metals with oxygen, water and acids, as well as displacement reactions, the metals have been arranged in a group or series according to their chemical reactivity. The arrangement of metals in a vertical column in the order of decreasing reactivities is called reactivity series of metals (or activity series of metals). In reactivity series, the most reactive metal is placed at the top whereas the least reactive metal is placed at the bottom. As we come down in the series, the chemical reactivity of metals decreases. Since the metals placed at the bottom of the reactivity series (like silver and gold) are less reactive, so they are usually found in free state (native state) in nature.

49. When metal Z is added to dilute HCl solution, there is no evolution of gas. Metal is :
- (a) K                      (b) Na                      (c) Ag                      (d) Zn
50. Copper sulphate solution can be safely kept in a container made of :
- (a) aluminium                      (b) lead                      (c) silver                      (d) zinc
51. Metal always found in free state is :
- (a) gold                      (b) silver                      (c) copper                      (d) sodium
52. In the combined state, zinc is mainly found as –
- (a) chloride                      (b) bromide                      (c) oxide                      (d) sulphide

## Case -II

A student performed an experiment to demonstrate that a plant needs chlorophyll for photosynthesis. He used plants that had green leaves with white areas. After exposing the plants to sunlight, he removed a leaf from each plant and processed the leaves to remove the chlorophyll. He then tested each leaf for the presence of starch. Starch was found in the area of the leaf that was green and no starch was found in the area of the leaf that was white. He concluded that chlorophyll is necessary for photosynthesis.

53. Starch is converted to chlorophyll in the region of
- (a) White areas of the leaf. (b) White and green areas of the leaf  
(c) green areas of the leaf (d) all the areal of the leaf
54. In a typical plant, all of the following factors are necessary for photosynthesis except.
- (a) Chlorophyll (b) light (c) Oxygen (d) Carbondioxide
55. Plants are green because they contain
- (a) Photosynthesis (b) Chlorophyll (c) green dye (d) starch
56. Leaves which have patches of white and green are called
- (a) Striped leaves (b) Diseased leaves (c) Patterned leaves (d) Variegated leaves

## Case -III

A relationship among the object distance ( $u$ ), the image distance ( $v$ ) and the focal length ( $f$ ) of a mirror is called the mirror formula. Mirror formula holds for both concave and convex mirrors. A concave mirror has positive focal length while convex mirror has negative focal length.

57. An object 3 cm high is placed at a distance of 10 cm in front of a concave mirror of focal length 20 cm. The position, nature of the image formed is
- (a) 10 cm (b) 20 cm (c) 30 cm (d) 40 cm
58. An object, 4.0 cm in size, is placed at 25.0 cm in front of a concave mirror of focal length 15.0 cm. The distance from the mirror should a screen be placed in order to obtain a sharp image is
- (a) -32.5 cm (b) -35 cm (c) -37.5 cm (d) -40 cm
59. Consider the following statements:
- I. The values of  $u$  and  $f$  for a concave mirror are always negative by convention.  
II. The magnification of convex mirror is always positive.  
III. A concave mirror always forms a virtual, erect and smaller image.
- Which of these statement(s) is/are correct?
- (a) I and II (b) I and III (c) II and III (d) All are correct
60. An object is placed at a distance of 8 cm from a concave mirror of focal length 10 cm. The position of the image is.
- (a) 10 cm (b) 15 cm (c) 20 cm (d) 40 cm