Sample Paper

4

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. $H_2S(g) + Cl_2(g) \rightarrow 2HCl(g) + S(s)$

The reaction is interpreted as:

(a) H_2S is getting oxidized and Cl_2 is getting reduced (b) H_2S is getting reduced and Cl_2 is getting oxidized

(c) Only H_2S is oxidized. (d) Both H_2S and Cl_2 are reduced.

2. An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?

(a) Baking powder (b) Lime

(c) Ammonium hydroxide solution (d) Hydrochloric acid

3. Which of the following compound is covalent in nature?

(a) Carbon tetrachloride (b) Ammonium chloride

(c) Lithium chloride (d) Calcium chloride

4. For the followingh reaction

$$C_3H_8 + xO_2 \longrightarrow yCO_2 + 2H_2O$$

The correct coefficient for p, q, r, s

	p	q	r	s
(a)	2	10	5	48
(b)	1	10	3	8
(c)	1	5	3	4
(d)	2	5	6	8

5. 'Alum' is an example of–

(a) single salt (b) double salt (c) acids (d) none of the above

6. An element can react with oxygen to give a compound with high melting point. This compound is also water soluble. The element is likely to be

(a) Calcium (b) Carbon (c) Silicon (d) Iron

7. Which of the following is not correctly matched with the gaseous product on decomposition.

(a) $KClO_3 \xrightarrow{\Delta} O_2$ (b) $ZnCO_3 \xrightarrow{\Delta} CO_2$

(c) $H_2CO_3 \xrightarrow{\Delta} H_2$ (d) $C_2H_6 \xrightarrow{\Delta} H_2O$

8. What are the four properties of an ionic compound?

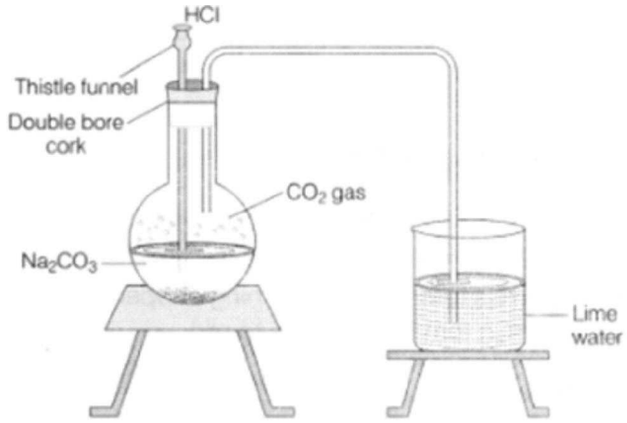
(a) They form crystals, are very brittle, have high melting points, and conduct electricity when melted

(b) they form crystals, are very sturdy, have high melting points, and conduct electricity when solid

(c) They form crystals, are very brittle, have low melting points, and conduct electricity when melted

(d) They form crystals, are very brittle, have high melting points, and conduct electricity when solid

9.



In the above set of experiment if reactant is changed to $KHCO_3$ then

(a) Lime water will not turn milky (b) Lime water will turn milky.

(c) Reaction is vigorous. (d) KCl will be formed.

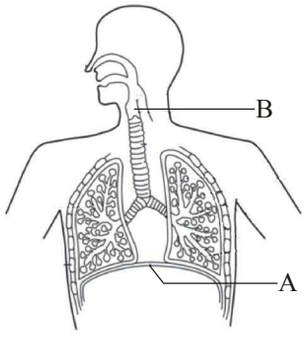
Which of the above statement is not correct?

10. Hydrogen sulphide (H_2S) is a strong reducing agent. Which of the following reactions shows its reducing action?

(a) $Cd(NO_3)_2 + H_2S \longrightarrow CdS + 2HNO_3$ (b) $CuSO_4 + H_2S \longrightarrow CuS + H_2SO_4$

(c) $2FeCl_3 + H_2S \longrightarrow 2FeCl_2 + 2HCl + S$ (d) $Pb(NO_3)_2 + H_2S \longrightarrow PbS + 2CH_3COOH$

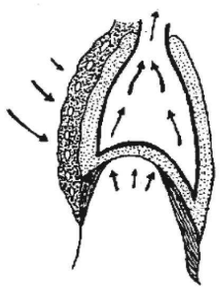
11. The given diagram represents the human respiratory system. Identify the labelled part A and B respectively.



(a) Diaphragm and Pharynx (b) Pharynx and Trachea

(c) Diaphragm and Larynx (d) Trachea and Pharynx

12. The given diagram represents the mechanism of breathing. It indicates inspiration process or expiration process.



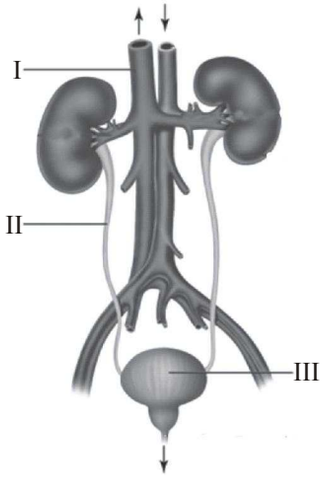
(a) Inspiration (b) expiration

(c) Both of them (a) and (b) (d) None of them

13. Erythropoesis may be stimulated by the deficiency of

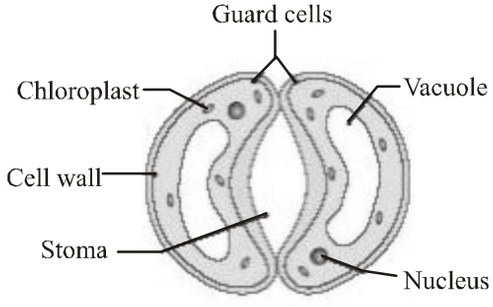
(a) Iron (b) Oxygen (c) Protein (d) None of these

14. The given diagram shows the human urinary system and labelled as I, II and III. Which part shows vena cava and ureter



(a) I & II (b) II & III (c) I & III (d) None of them

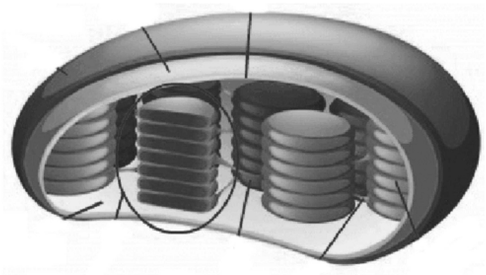
15. Identify the condition of stomata which is represented in the figure



(a) Stomata is in close condition (b) Stomata shows open condition

(c) Both (a) & (b) (d) None of these

16. Observe the given diagram and match the correct its sequence from the column I & II.



Column I		**Column II**
(A)	(i)	It is a choroplast
(B)	(ii)	Photosynthesis occurs in chloroplast
(C)	(iii)	Chloroplant is present in animal
(D)	(iv)	Mitochonadria is present in plant

(a) A – (i); B – (iii); C – (iv) (b) A – (iv); B – (v); C – (ii)

(c) A – (i); B – (ii); C – (iv) (d) None of them

17. An object is placed in front of a concave mirror of focal length 50.0 cm and a real image is formed 75 cm in front of the mirror. How far is the object from the mirror

(a) 25 cm (b) 30 cm (c) 150 cm (d) –150 cm

18. A real image is formed by a convex mirror when the object is placed at

(a) infinite (b) between center of curvature and focus

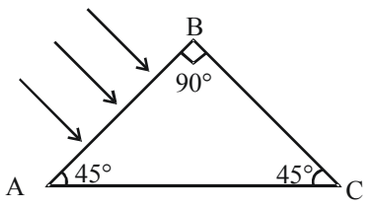
(c) between focus and pole (d) None of the above

19. A virtual image is formed by a concave mirror when the object is placed between

(a) infinity and center of curvature (b) center of curvature and focus

(c) focus and the pole (d) All of the above

20. A beam of light consisting of red, green and blue colours is incident on a right-angled prism as shown. The refractive index of the material of the prism for the above red, green and blue wavelengths are 1.39, 1.44 and 1.47 respectively. The prism will



(a) separate part of the red colour from the green and blue colours.

(b) separate part of the blue colour from the red and green colours.

(c) separate all the three colours from one another.

(d) not separate even partially any colour from the other two colours.

21. A ray of light travels from medium X to medium Y. No refraction occurs if ray of light hits the boundary of medium Y at an angle of

(a) 30° with normal (b) 45° with normal (c) 60° with normal (d) 0° with normal

22. The concave mirrors are used in

(a) reflecting telescopes (b) magic- lanterns (c) cinema projectors (d) All of these

23. In case of a real and inverted image, the magnification of a mirror is
(a) positive (b) negative (c) zero (d) infinity

24. Magnification produced by a rear view mirror fitted in vehicles
(a) is less than one
(b) is more than one
(c) is equal to one
(d) can be more than or less than one depending upon the position of the object in front of it.

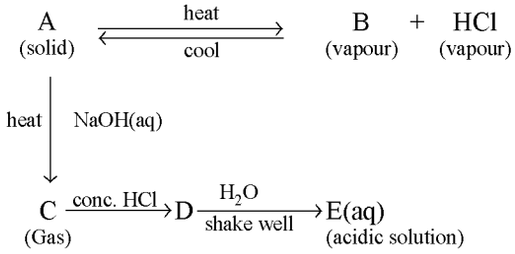
SECTION-B

*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. 10 mL of a solution of NaOH is found to be completely neutralised by 8 mL of a given solution of HCl. If we take 20 mL of the same solution of NaOH, the amount of HCl solution (the same solution as before) required to neutralise will be –
(a) 4mL (b) 8mL (c) 12mL (d) 16mL

26. _____ gas is evolved when Mn react with very dilute HNO_3
(a) NO_2 (b) H_2 (c) N_2O (d) NO

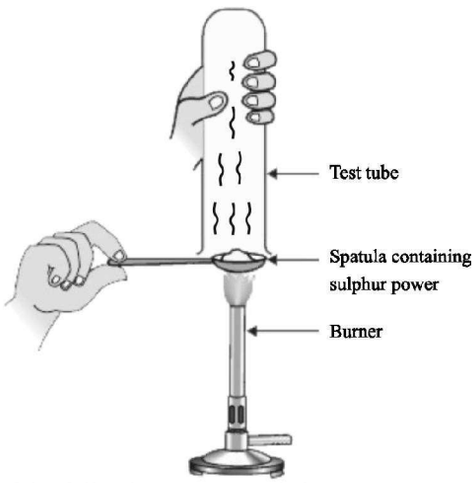
27. The schematic diagram is given below



Which of the following is a correct statement ?
(a) A and E are chemically same. (b) A and D are chemically same.
(c) D and E are chemically same. (d) C and E are chemically same.

28. Which of following compound is alkaline in aqueous medium.
(a) Na_2CO_3 (b) NaCl (c) H_2CO_3 (d) $CuSO_4$

29.



Based on the above experiment which of the following statement is incorrect.
(a) The gas is SO_2 will change the colour of moist litmus paper from blue to red.
(b) The colour change of litmus paper is due to formation of H_2SO_3 (sulphurous acid) buy dissolution of SO_2 in water.
(c) The gas change the colour of dry litmus paper.
(d) The gas is acidic in nature

30. Double decomposition reactions are–

(i) $Mg + CuSO_4 \longrightarrow MgSO_4 + Cu$ (ii) $KOH + HNO_3 \longrightarrow H_2O + KNO_3$

(iii) $Na_2S + 2HCl \longrightarrow 2NaCl + H_2S$ (iv) $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HCl$

(a) (i), (ii) (b) (ii), (iii) (c) (i), (ii), (iii) (d) (ii), (iii), (iv)

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.

31. **Assertion :** Dry HCl gas does not change the colour of blue litmus paper to red.

Reason : Dry HCl gas is strongly basic.

32. **Assertion:** Sodium, potassium and magnesium are never found as free elements in nature.

Reason: Sodium, potassium and magnesium are reactive elements.

33. **Assertion:** Photorespiration decreases net photosynthesis.

Reason: Rate of respiration in dark and light is almost same in all plants.

34. **Assertion :** When ray of light falls on the particles of a colloidal solution, the path of the beam is visible.

Reason : Path of light is visible due to the scattering of light by the colloidal particles.

35. **Assertion :** Corrosion of iron is commonly known as rusting.

Reason : Corrosion of iron occurs in presence of water and air.

36. Which of the following is not an enzyme?

(a) Lipase (b) Amylase (c) Trypsin (d) Bilirubin

37. Cow has a special stomach as compared to that of a lion in order to

(a) absorb food in better manner. (b) digest cellulose present in the food.

(c) assimilate food in a better way. (d) absorb large amount of water.

38. Pancreatic juice contains more than one enzyme. Which among the following combination is correct?

(a) Pepsin and Lipase (b) Amylase and Pepsin

(c) Pepsin and Trypsin (d) Trypsin and Lipase

39. A virtual, erect and magnified image of an object is to be produced with a concave mirror of focal length 12 cm. Which of the following object distance should be chosen for this purpose?

(a) 10 cm (b) 14 cm (c) 18 cm (d) 24 cm

40. A 10 mm long awlpin is placed vertically in front of a concave mirror. A 5 mm long image of the awl pin is formed at 30 cm in front of the mirror. The focal length of this mirror is

(a) – 30 cm (b) – 20 cm (c) – 40 cm (d) – 60 cm

41. A column of water within xylem vessels of tall trees does not break under its weight because of:

(a) Tensile strength of water (b) Lignification of xylem vessels

(c) Positive root pressure (d) Dissolved sugars in water

42. Which one of the following organs is NOT a site for the production of white blood cells?

(a) Bone marrow (b) Kidney

(c) Liver (d) Spleen

43. The bluish colour of water in deep sea is due to

(a) the presence of algae and other plants found in water

(b) reflection of sky in water

(c) scattering of light

(d) absorption of light by the sea

44. A full length image of a distant tall building can definitely be seen by using

(a) a concave mirror (b) a convex mirror

(c) a plane mirror (d) both concave as well as plane mirror

45. Read the following statements and mark the correct option.

(I) Refraction of light is due to change in speed of light while traveling from one medium to other.

(II) When light travels from rarer to denser medium, it bends away from normal.

(a) Only (I) is correct (b) Only (II) is corect

(c) Both (I) and (II) is correct (d) None is correct

46. A person standing at some distance from a mirror finds his image erect, virtual and of the same size. Then the mirror is possibly

(a) plane mirror (b) concave mirror

(c) plane or concave mirror (d) plane or concave or convex mirror

47. A glass beaker is filled with water up to 5 cm. It is kept on top of a 2 cm thick glass slab. When a coin at the bottom of the glass slab is viewed at the normal incidence from above the beaker, its apparent depth from the water surface is *d* cm. Value of *d* is close to (the refractive indices of water and glass are 1.33 and 1.5, respectively)

(a) 2.5 cm (b) 5.1 cm (c) 3.7 cm (d) 6.0 cm

48. Those substance are considered to be Arhenius acid which can furnish hydrogen ion in aqueous medium. Would gaseous HCl be considered as an Arrhenius acid?

(a) Yes (b) No

(c) Not known (d) Gaseous HCl does not exist

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. Which of the following will give displacement reactions ?

(a) NaCl solution and copper metal (b) $MgCl_2$ solution and aluminium metal

(c) $FeSO_4$ solution and silver metal (d) $AgNO_3$ solution and copper metal

Case-II

Heterotrophic nutrition is a type of nutrition in which organisms obtain that food from other sources. Such type of the organisms that depend upon outside sources for their food are called as heterotrophs.

Heterotrophic nutrition is classified as saprophytic, holozoic and parasitic nutrition.

53. Which of the following in an example of parasite?

(a) Heterotrophic (b) Yeast (c) Earthworm (d) Taenia

54. Heterotrphic nutrition means

(a) Utilisation of energy obtained by plants

(b) Simple sugar is produced from inorganic compounds

(c) Utilisation of chemical energy to prepare food

(d) All of these

55. Which of the following organism is an example of the saprotroph?

(I) Mushroom (II) Euglena (III) Plant (IV) Amoeba

(a) only I (b) I and II (c) II and III (d) I, II, III and IV

56. Which of the following fixed carbon dioxide into sugar.

(a) Autotroph (b) Heterotroph (c) Both (a) & (b) (d) None of these

Case-III

The phenomenon of decomposition of the white light into its seven component colours when passing through a prism or through a transparent object delimited by non parallel surfaces is called dispersion of light. A beam of light containing all the visible spectrum of the light is white, because the sum of all the colors generates the white color. The light is decomposed in all the component colours, Violet, Indigo, Blue, Green, Yellow, Orange and Red, called as VIBGYOR. The band of the coloured components of a light beam is called its spectrum. The phenomenon can be explained by thinking that light of different colours (different wavelengths) has different velocities while travelling in a medium $v_m = f\lambda_m$.

Hence, the change in velocity of light observed when the light passes from the air to the glass, depends on the wavelength.

57. Which of the following statements is correct regarding the propagation of light of different colours of white light in air?

(I) Red light moves fastest

(II) Blue light moves faster than green light

(III) All the colours of the white light move with the same speed

(IV) Yellow light moves with the mean speed as that of the red and the violet light

(a) only I is correct (b) only III is correct

(c) only II and III is correct (d) only III and IV is correct

58. When white light is allowed to pass through a glass prism, which colour deviates the least?

(a) Violet (b) Red (c) Green (d) Orange

59. When white light is allowed to pass through a glass prism, which colour deviates the most?

(a) Indigo (b) Green (c) Red (d) Violet

60. For a prism material, refractive index is highest for

(a) Red (b) Yellow

(c) Orange (d) Violet Passage Based Questions