Sample Paper

5

**Time : 90 Minutes**   **Max. Marks : 40**

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 metal carbonate X on reacting with an acid gives a gas which when passed through a solution Y gives the carbonate back. On the other hand, a gas G that is obtained at anode during electrolysis of brine is passed on dry Y, it gives a compound Z, used for disinfecting drinking water. Identity X, Y, G and Z.
   (a) $NaHCO_3, CO_2, Ca(OH)_2, CaOCl_2$
   (b) $CaCO_3, Ca(OH)_2, O_2, CaOCl_2$
   (c) $CaCO_3, Ca(OH)_2, CaOCl_2$
   (d) $NaHCO_3, Ca(OH)_2, CO_2, CaOCl_2$

2.   Which of the following metals react with conc. sulphuric acid but does not react with a solution of ferrous sulphate?
   (a)   Cu   (b)   Zn   (c)   Fe   (d)   Mg

3.   In which of the following case beaker for H_2 gas will remain empty
   (a) $Zn + H_2SO_4$ (b) $Fe + H_2SO_4$ (c) $Cu + H_2SO_4$ (d) $Mg + H_2SO_4$

4.   Common salt besides being used in kitchen can also be used as the raw material for making
   (i)   washing soda   (ii)   bleaching powder   (iii) baking soda   (iv)   slaked lime
   (a)   (i) and (ii)   (b)   (i), (ii) and (iv)   (c)   (i) and (iii)   (d)   (i), (iii) and (iv)

5.   Copper sulphate solution can be safely kept in a container made of –
   (i)   platinum   (ii)   lead   (iii) silver   (iv)   zinc
   (a)   (i), (ii) and (ii)   (b)   (ii) and (iii)   (c)   (i) and (iii)   (d)   (ii), (iii) and (iv)

6.   Rancidity is not prevented by –
   (a)   adding anti-oxidants
   (b)   packaging oily food in nitrogen gas
   (c)   packaging oily food in argon gas
   (d)   use of spices

7.   Which of the following is not a property of Acid and bases –
   (a)   electrolytes.
   (b)   non–electrolytes.
   (c)   neutralize each other.
   (d)   cause indicators to change colors.
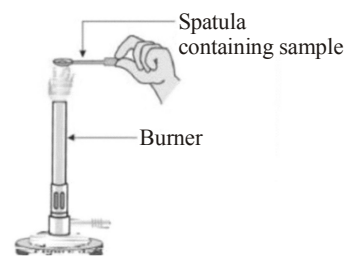
8.   Samples

   $$X \xrightarrow{+Cl_2} Y$$
   High m.pt
   and boiling point
   and water soluble
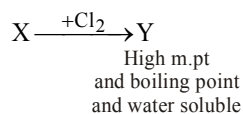
   x is
   (a)   Carbon   (b)   Argon   (c)   Magnesium   (d)   Neon

9. what will not happen if NaHCO3 is taken as sample?

   (a) It will decompose
   (b) Na_2CO_3 is produced
   (c) Oxygen is produced
   (d) H_2O is produced


   Spatula containing sample
   Burner

10. Which of the following can not conduct electricity?
    (i) Distilled water   (ii) Rain water   (iii) Lemon water   (iv) Glucose solution
   (a) (ii) and (iv)   (b) Only (iv)   (c) (i), (ii) and (iv)   (d) (i) and (iv)

11. Given below is the diagram of a stomatal apparatus in which of the following all the four parts labelled as A, B, C and D are correctly indentified?
    (a) A-epidermal cells, B-subsidiary cells, C-stomatalpore, D-chloroplast
    (b) A-epidermal cells, B-subsidiary cells, C-chloroplast, D-stomatal pore
    (c) A-stomatalpore, B-subsidiary cells, C-epidermal cells, D-chloroplast
    (d) A-subsidiary cells, B-epidermal cells, C-stomatalpore, D-chloroplast

    A B D C
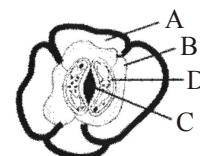
12. Choose the correct option indicates the correct function of location P, Q, R, S.
    (a) P-mouth-passage for ingestion of food.
    (b) Q-Oesophagus-emulsifies the fat present in food.
    (c) R-Liver-secrete gastric juice which contains HCL and mucus.
    (d) S-Large Intestine-stores and process the food and then releases in the blood.


    P Q R S
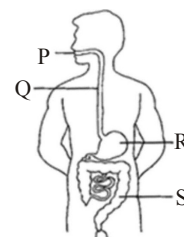
13. How is the working of kidney dialysis machine similar to a healthy kidney?
    (a) It takes sugar molecules out of the blood.
    (b) It regulates the concentration of the blood.
    (c) It deaminates amino acids to urea.
    (d) It removes large molecules from the blood.

14. The diagram below shows the arrangement of cells inside the leaf of a green plant. Which cells normally contain chloroplast?
    (a) 1 and 2
    (b) 1 and 4
    (c) 2 and 3
   (d) 2 and 4

    1 2 3 4
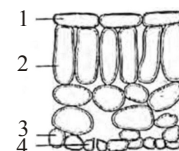
15. The correct sequence of anaerobic respiration in Yeast is

    (a) Glucose <u>cytoplasm</u> Pyruvate <u>mitochondria</u> Ethanol + Carbondioxide

    (b) Glucose <u>cytoplasm</u> Pyruvate <u>cytoplasm</u> Lactic acid

    (c) Glucose <u>cytoplasm</u> Pyruvate <u>mitochondria</u> Lactic acid

    (d) Glucose <u>cytoplasm</u> Pyruvate <u>cytoplasm</u> Ethanol + Carbondioxide

16. Observe the diagram of Chloroplast.
    Match the labelling referred in Column 1 and Correlate with the function in Column 2.

Column I		Column II
(i)	1,2	A. Inner membrane space, Inter membrane space
(ii)	3	B. Stroma, Thylakoid
(iii)	4,5	C. Lamellae
(iv)	6	D. Outer membrane

    (a) (i)-B, (ii)-A, (iii)-B, (iv)-C
    (b) (i)-A, (ii)-D, (iii)-B, (iv)-C
    (c) (i)-A, (ii)-D, (iii)-D, (iv)-B
    (d) (i)-A, (ii)-B, (iii)-D, (iv)-C
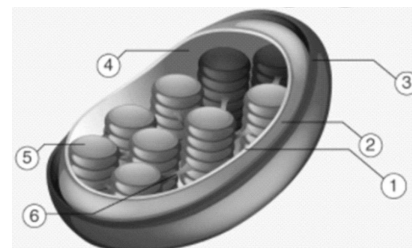
17. Lens formula is

    (a) $\dfrac{1}{v} + \dfrac{1}{u} = \dfrac{1}{f}$
    (b) $\dfrac{1}{v} + \dfrac{1}{2u} = \dfrac{1}{f}$
    (c) $\dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{f}$
   (d) $\dfrac{1}{v} - \dfrac{1}{2u} = \dfrac{1}{f}$

18. Focal length of a lens is 50 cm. In dioptre, power of lens will be
    (a) 0.02 D
    (b) 2 D
    (c) 0.2 D
    (d) 50 D

19. Correct relation between radius of curvature (R) and focal length (F) of spherical mirror is
    (a) $R = \dfrac{F}{2}$
    (b) $R = F$
    (c) $R = 2F$
    (d) R

20. In case of a convex lens, what is the minimum distance between an object and its real image?
    (a) 2.5 times of focal length
    (b) 2 times of focal length
    (c) 4 times of focal length
    (d) equal to focal length

21. Figure shows a ray of light as travels from medium 1 to medium 2. If reflective index of medium 1 with respect to medium 2 is

    $\dfrac{\sqrt{2}}{\sqrt{3}}$ then the value of angle x is

    (a) 30°
    (b) 60°
    (c) 15°
    (d) 45°

22. How many time does a ray bend on passing through a prism?
    (a) Once
    (b) Twice
    (c) Thrice
    (d) None

23. A ray passing through which part of a lens emerges undeviated–
    (a) Focus
    (b) Centre of curvature
    (c) Optical centre
    (d) between Focus and centre of curvature

24. A convex lens has focal length 30 cm. If an object is placed at a distance of 15 cm from it then the magnification produced by the lens is
    (a) 6.66
    (b) 0.5
    (c) 1
    (d) 2
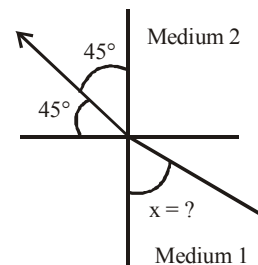
SECTION-B

*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. Take $CaCl_2$ in four test tube A, B, C and D. Then add kerosene in test tube A. Petrol in test tube B, Alcohol in test tube C and water in test tube D
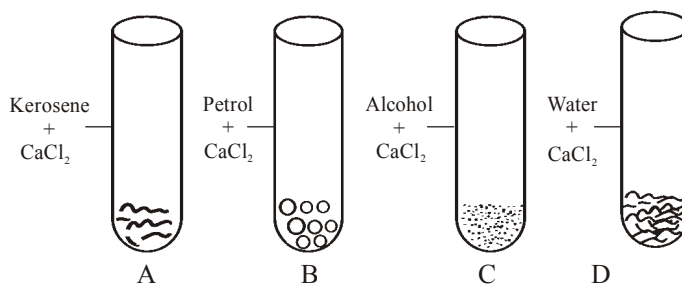
    Clear solution will appear in test tube
    (a) A
    (b) B
    (c) C, D
    (d) D

26. Ferrous sulphate on heating does not yield
    (a) ferric oxide
    (b) sulphur dioxide
    (c) oxygen
    (d) water

27. A blue litmus paper was first dipped in dil. HCl and then in dil. NaOH solution. It was observed that the colour of the litmus paper–
    (a) changed to red.
    (b) changed first to red and then to blue.
    (c) changed blue to colourless.
    (d) remains blue in both the solutions.

28. Which of the following is incorrect?
    (a) Two metals which are alloyed with iron to make stainless steel: Nickel and chromium
    (b) Two metals which are used to make jewellary: Gold and platinum
    (c) A metal which is so soft that, it can be cut with knife and a non-metal which is the hardest sustance: sodium and Iodine
    (d) A metal and a non-metal which exist as liquid at room temperature: Mercury and Bromine

29. Consider the following reaction
    $$Pbs + nH_2O_2 \longrightarrow PbSO_4 + 4H_2O$$
    What is the value of coefficient 'n' in the above equation?
   (a) 1
    (b) 2
    (c) 3
    (d) 4

30. Which of the following statements is correct about an aqueous solution of an acid and of a base?
    (i) Higher the pH, stronger the acid
    (ii) Higher the pH, weaker the acid
    (iii) Lower the pH, stronger the base
    (iv) Lower the pH, weaker the base
    (a) (i) and (iii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii) and (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:** MgO has higher melting point than sodium chloride.
    Reason: Magnesium ions and oxide ions have a greater charge than sodium ions and chloride ions.
32. **Assertion :** In a redox reaction, the oxidation number of the oxidant decreases, while that of reductant increases.
    Reason : Oxidant gains electron (s) reductant loses electrons (s).
33. **Assertion:** Respiration is opposite of photosynthesis.
    Reason: In photosynthesis, food in made from energy and in respiration food is converted to energy.
34. **Assertion :** A convex mirror is used as a driver's mirror.
    Reason : Because convex mirror's field of view is large and images formed are virtual, erect and diminshed.
35. **Assertion :** H_2CO_3 is a strong acid.
    Reason : A strong acid dissociates completely or almost completely in water.
36. Urea is produced in one organ, filtered from the blood by a second organ and stored inside a third organ before being expelled from the body. Which organs carry out these functions?

	Production	**Filtration**	**Storage**
(a)	Kidney	Bladder	Liver
(b)	Kidney	Liver	Bladder
(c)	Liver	Bladder	Kidney
(d)	Liver	Kidney	Bladder

37. Which one of the following is a correct outline of the main events in photosynthesis?
    (a) Oxygen reacts with a carbohydrate to produce water and carbondioxide in the presence of light.
    (b) Light joins carbondioxide to an acceptor compound whcih is then reduced by hydrogen obtained from water.
    (c) Light splits water and the resulting hydroxyl group combines with a compound which has incorporated carbondioxide.
    (d) Carbondioxide combine with an acceptor compound and this is reduced by hydrogen split from water by light.
38. Choose the incorrect statement.
    (a) The force that blood exerts against the wall of the vessel is called Blood Pressure.
    (b) The blood pressure is much greater in arteris than in veins.
    (c) The pressure of blood inside the artery during contraction is called Diastolic Pressure.
    (d) High blood pressure is also called Hypertension.
39. Light travels through a glass slab of thickness t and having refractive index n. If c is the velocity of light in vacuum then the time taken by light to travel this thickness of glass is
    (a) $\dfrac{t}{nc}$ (b) $\dfrac{nt}{c}$ (c) $\dfrac{n^2 t}{c}$ (d) $\dfrac{t}{n^2 c}$
40. A ray of light is incident on the surface of transparent medium at an angle of 45° and is refracted in the medium at an angle of 30°. What will be the velocity of light in the transparent medium?
    (a) 1.96×10^8 m/s (b) 2.12×10^8 m/s (c) 2.65×10^8 m/s (d) 1.25×10^8 m/s
41. Plants use a variety of techniques to get rid of waste material. Waste products excreted by plants are-
    (a) Resins & Gums (b) O_2 & CO_2 (c) CO_2 & Water (d) Resins and O_2
42. Which is an example of active transport?
    (a) Movement of glucose into the cells of the villi.
    (b) Movement of glucose molecules down a concentration gradient.
    (c) Movement of ions in blood plasma.
    (d) Movement of water in the transpiration stream.

43. Read the given statements and mark the correct option.
  (I) White colour of cloud is due to scattering of light
  (II) Sun is visible two minutes before the actual sunrise due to atmospheric refraction.
  (a) Only (I) is correct   (b) Only (II) is correct
  (c) Both (I) and (II) is correct   (d) None is correct

44. For an incident ray directed towards centre of curvature of a spherical mirror the reflected ray
  (a) retraces its path   (b) passes through focus
  (c) passes through the pole   (d) becomes parallel to the principal axis

45. The image formation in a convex lens is shown in the following figure.
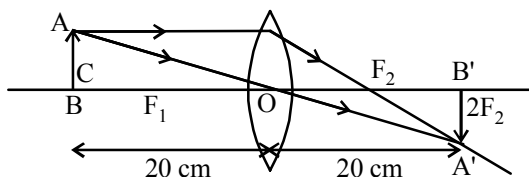
AB is the object and A'B' is the image. The focal length of the lens is
  (a) 40 cm   (b) 10 cm   (c) 20 cm   (d) 05 cm

46. The lenses of power +3.5D, +2.5D and +1D are placed in contact with each other in an optical device. The effective power of combination of these lenses is :
  (a) 5 D   (b) 6 D   (c) 7 D   (d) 8 D

47. A ray of light follows the path as shown in figure as it travels through different media. Choose the correct relation regarding refractive indices from the given alternatives.
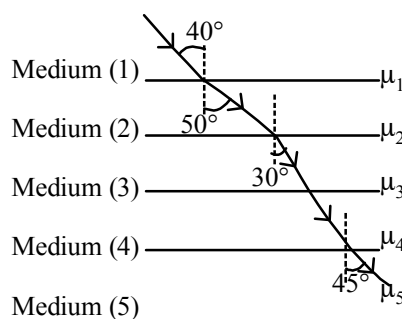
  (a) $\mu_1 > \mu_2 < \mu_3 = \mu_4 > \mu_5$ (b) $\mu_1 = \mu_2 < \mu_3 = \mu_4 > \mu_5$

  (c) $\mu_1 > \mu_2 < \mu_3 > \mu_4 < \mu_5$ (d) $\mu_1 < \mu_2 < \mu_3 = \mu_4 > \mu_5$

48. (i) X is hard and has shiny appearance but can poorly conduct electricity at low temperature. At high temperature it can conduct electricity. It has high m.p.t. It is used to make high melting electrical devices.

  (ii) Y is soft, shiny, lustrous element but can not conduct electricity. It shows the property of sublimation.

  (iii) Z is brittle, has high melting point. It can conduct electricity in molten state or aqueous solution.

  Which of the following is most probable alternate for above description of x, y, z.
  (a) Silver, Graphite, KCl
  (b) Copper, naphthalene, $CaCl_2$
  (c) Aluminium, Camphor, MgO
  (d) Tungsten, Iodine, NaCl

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

A **balanced chemical equation** has equal numbers of atoms for each element involved in the reaction are represented on the reactant and product sides. This is a requirement that the equation must satisfy to be consistent with the law of conservation of matter. It may be confirmed by simply summing the numbers of atoms on either side of the arrow and comparing these sums to ensure they are equal.

Reaction	Stoichiometric cofficient of reactants	Stoichiometric coefficient of products
1. $C_2H_6 + O_2 \rightarrow H_2O + CO_2$	X : C_2H_2, Y : O_2	A : H_2O, B : CO_2
2. $Al_{(s)} + H_2SO_{4(aq)}4(aq) \rightarrow Al_2(SO_4)_3(aq) + H_2(g)$	X : Al, Y : H_2SO_4	A : $Al_2(SO_4)_3$, B: H_2

49. In chemical reaction 1 , X and Y should be
(a) 1, 7/2   (b) 1, 3   (c) 1, 5/2   (d) 1, 3
50. In chemical reaction 1, A and B should be
(a) 1, 2   (b) 1, 3   (c) 2, 3   (d) 3, 2
51. In chemical reaction 2 , X and Y should be
(a) 2, 4   (b) 2, 3   (c) 1, 2   (d) 1, 4
52. In chemical reaction 2 , A and B should be
(a) 1, 3   (b) 2, 3   (c) 2, 3   (d) 1, 4

Case-II

A star-shaped figure was cut in the black paper strip used for covering the leaf of a destarched plant used for demonstrating that light is necessary for photosynthesis. At the end of the experiment when the leaf was tested for starch with iodine, the star shaped figure on the leaf was found to be blue-black in colour.

53. When iodine was added to a particular vegetable, which has been crushed into a paste, blue-black colour was obtained. This indicates the presence of
(a) Glucose   (b) Sugar   (c) Starch   (d) Protein
54. Which one combination of relevant materials required for setting up an experiment to show that light is necessary for photosynthesis?
(a) Destarched leaves, strips of black paper, starch solution and iodine crystals.
(b) Plotted plant, strips of coloured paper, starch solution, iodine and potassium iodide.
(c) Destarched leaves, strips of black paper, starch solution and potassium iodide.
(d) Destarched leaves, strips of black paper, iodine solution.
55. In order to destarch the leaves for an experiment to show that sunlight is necessary for photosynthesis, the
(a) Plant with the leaves kept in a dark room for 24 hours.
(b) Plant with the leaves exposed to light of a lamp, a night before the experiment.
(c) Leaves are kept in alcohol & boiled in a water bath.
(d) Leaves are soaked in iodine for two hours.
56. In the experiment to prove that light is necessary for photosynthesis, which one of the following is not required?
(a) Alcohol   (b) Iodine   (c) KOH   (d) Water

Case-III

Newton took two prisms P_1 and P_2 of same material and having the same refracting angle. He made white light pass through a slit and allowed it to fall on prism P_1. He obtained a spectrum on white screen. He removed the white screen and placed prism P_2 in an inverted position. It is observed that the light coming out of second prism was almost white.

57. When a ray of light passes through a prism,
(I) it goes undeviated   (II) it get splits into seven colours
(III) it bends towards the base
(a) only I is correct   (b) only II is correct   (c) only II and III is correct   (d) only I and III is correct
58. In the visible spectrum the colour having the shortest wavelength is
(a) Green   (b) Red   (c) Violet   (d) Blue
59. The splitting of white light into several colours on passing through a glass prism is due to
(a) refraction   (b) reflection   (c) interference   (d) diffraction
60. White light is incident at an angle to the surface of a triangular piece of glass. Which color of light deviates most from its original path after leaving the glass?
(a) red   (b) orange   (c) green   (d) violet