Name:  Section:  Reg. No.

# One Mark Test - 1

## Standard XI

## CHEMISTRY

Time : 1.00 hr. Marks : 50

**Choose and write the correct answer :** 50x1=50

1. The atomic mass of oxygen is 16. The actual mass of an oxygen atom .....

   a) $2.656\times10^{-23}$ g b) $2.656\times10^{23}$ g c) $2.656\times10^{-23}$ kg d) $2.656\times10^{23}$ kg ☐

2. Match the List I with List II.

| | *List I (Element)* | | *List II (equivalent mass (g $eq^{-1}$))* |
|---|---|---|---|
| A) | Zn | 1) | 32.66 |
| B) | $CO_3^{2-}$ | 2) | 32.7 |
| C) | $NO_3^-$ | 3) | 30 |
| D) | $H_3PO_4$ | 4) | 62 |

***Code :***

| | A | B | C | D |
|---|---|---|---|---|
| a) | 4 | 3 | 2 | 1 |
| b) | 2 | 3 | 4 | 1 |
| c) | 4 | 2 | 3 | 1 |
| d) | 1 | 2 | 3 | 4 |

☐

3. Assertion (A) : In the reaction between potassium permanganate and potassium iodide, permanganate ions acts as an oxidising agent.
   Reason (R) : Oxidation state of manganese changes from +2 to +7 during the reaction.
   a) Both (A) and (R) are true and (R) explain (A) b) Both (A) and (R) are true (R) does not explain (A)
   c) (A) is true but (R) is false d) Both (A) and (R) are false ☐

4. The change in the oxidation number of $C\ell$ in $C\ell_2$ and KOH in the following reaction $2C\ell_2 + 6KOH \rightarrow KC\ell + KC\ell O_3 + 3H_2O$
   a) $-1$ to 0, +4 to 0 b) $-1$ to 0, $-5$ to 1 c) $-5$ to 0, 0 to $-5$ d) 0 to +5, 0 to $-1$ ☐

5. Identify the correct statements with respect to the following reaction $Zn + HC\ell \rightarrow ZnC\ell_2 + H_2$
   i) Zinc is acting as an oxidant ii) Chlorine is acting as a reductant
   iii) Hydrogen is not acting as an oxidant iv) Zinc is acting as a reductant
   a) only (ii) b) only (iv) c) both (ii) and (iii) d) both (ii) and (i) ☐

6. $\overset{0}{Cu}(s) + 2\overset{+1}{Ag}NO_3(aq) \rightarrow \overset{+2}{Cu}(NO_3)_2(aq) + 2\overset{0}{Ag}(s)$ reaction example of .....
   (oxidation: Cu 0 → +2; reduction: Ag +1 → 0)
   a) metal displacement b) auto redox
   c) competitive electron transfer d) combination ☐

7. Which of the following is/are true with respect to carbon-12
   a) relative atomic mass carbon - 12 is 12u b) oxidation number of carbon is +4 in all its compounds
   c) 1 mole of carbon - 12 contain $6.022\times10^{22}$ carbon atoms d) all of these ☐

8. Consider the following statements
   i) Molarity = $\frac{\text{No of moles of solute}}{\text{Volume of solution in litres}}$ ii) Molality = $\frac{\text{No of moles of solute}}{\text{Mass of solvent in Kg}}$
   iii) Normality = $\frac{\text{No of moles of solution}}{\text{Volume of solute in litre}}$ iv) Equivalent mass of base = $\frac{\text{Molar mass of acid}}{\text{Basicity of acid}}$
   Which among the above statements is/are incorrect?
   a) (i), (iii) b) (iii), (iv) c) (i), (ii) d) (i), (iv) ☐

9. ..... volume of chlorine is required to form 11.2 L of $HC\ell$ at 273K and 1atm pressure.
   a) $7.5\ell$ b) $6.5\ell$ c) $4.5\ell$ d) $5.6\ell$ ☐

10. The maximum number of molecules is present in
    a) 15L of $H_2$ gas at STP b) 5L of $N_2$ gas at STP
    c) 0.5g at $H_2$ gas d) 10g of $O_2$ gas ☐

11. An organic compound containing C, H and N gave the following analysis C = 40%, H = 13.33%, N = 46.67%. Its empirical formula .....
    a) $C_2H_7N_2$ b) $CH_4N$ c) $CH_3N$ d) $C_2H_4N_2$ ☐

12. In a process 646g of ammonia is allowed to react with 1.44Kg of $CO_2$ to form urea. The limiting agent is .....
a) $NH_3$ b) Urea c) $CO_2$ d) None

13. Assertion (A) : Fluorine has an oxidation state of –1 in all its compounds.
Reason (R) : Fluorine is the most electro negative element of the periodic table.
a) Both (A) and (R) are true and (R) explains (A)
b) Both (A) and (R) are true but (R) does not explain (A)
c) (A) is true but (R) is false d) Both (A) and (R) are false

14. Identify disproportionation reaction.
a) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ b) $CH_4 + 4C\ell_2 \rightarrow CC\ell_4 + 4HC\ell$
c) $2F_2 + 2OH^- \rightarrow 2F^- + OF_2 + H_2O$ d) $2NO_2 + 2OH^- \rightarrow NO_2^- + NO_3^- + H_2O$

15. Match the List I with List II.

| List I | | List II | |
|---|---|---|---|
| A) | Molecular formula | 1) | Completely consumed |
| B) | Stoichiometric equation | 2) | Left unreacted |
| C) | Limiting reagent | 3) | n × Empirical formula |
| D) | Excess reagent | 4) | Balanced equation |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 3 | 4 | 2 | 1 |
| b) | 4 | 3 | 2 | 1 |
| c) | 3 | 4 | 1 | 2 |
| d) | 4 | 3 | 1 | 2 |

16. Identify the incorrect statement about a compound.
a) A molecule cannot be separated into its constituent elements by physical methods of separation
b) A molecule of a compound has atoms of different elements
c) A compound retains the physical properties of its constituent element
d) The ratio of atoms of different elements in a compound is fixed

17. Total number of electrons present in 1.7g of ammonia is
a) $6.022 \times 10^{23}$ b) $\frac{6.022 \times 10^{22}}{1.7}$ c) $\frac{6.022 \times 10^{24}}{1.7}$ d) $\frac{6.022 \times 10^{23}}{1.7}$

18. A gas such as carbonmonoxide would be most likely to obey the ideal gas law at
a) high T and high P b) high T and low P c) low T and high P d) low T and low P

19. A gas has a volume of 6.85 $dm^3$ at a pressure of 0.650 atm. When pressure is increased by 0.5atm? The volume is .....
a) 3.871 $dm^3$ b) 14.25 $dm^3$ c) 12.37 $dm^3$ d) 6.480 $dm^3$

20. Statement I : At very high pressure, compressibility factor is greater than 1.
Statement II : At very high pressure, 'b' can be neglected in Van der Waal's gas equation.
a) Both statements I and II are true and statement II explains I
b) Both statements I and II are true but statement II not explains I
c) Statement I is true but statement II is false d) Both statements are false

21. Match the List I with List II.

| List I | | List II | |
|---|---|---|---|
| A) | Permanent gas | 1) | 2a / Rb |
| B) | Temporary gas | 2) | $N_2$ |
| C) | $T_i$ | 3) | low $T_c$ |
| D) | Joule Thomson effect | 4) | $NH_3$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 2 | 3 | 4 | 1 |
| b) | 4 | 1 | 2 | 3 |
| c) | 1 | 2 | 3 | 4 |
| d) | 3 | 4 | 1 | 2 |

22. Consider the following statements.
i) Atmospheric pressure is less at the top of a mountain than at sea level
ii) Gases are much more compressible than solids or liquids
iii) When the atmospheric pressure increase the height of the mercury column rises.
Select the correct statement.
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

23. The Van der Waal's constant 'a' for different gases are given below.

| (Gas) | ('a' value $(dm^3)$ $atm.mol^{-2}$) |
|---|---|
| $O_2$ | 1.360 |
| $N_2$ | 1.390 |
| $CH_4$ | 2.293 |
| $NH_3$ | 4.170 |

The gas which can be most easily liquefied is
a) $O_2$ b) $N_2$ c) $CH_4$ d) $NH_3$

24. Pressure of mixture of 4g $CO_2$ and 2g of $H_2$ confined in a bulb of 1 litre at 0°C is
a) 25.215 atm b) 31.205 atm c) 42.215 atm d) 15.210 atm

25. Passenger aeroplane cabins is artificially pressurised since
a) Pressure decreases with the increase in altitude b) Pressure increases with the increase in altitude
c) Temperature increases with the increase in altitude d) None of the above

26. Match the List I with List II.

| | *List I (Law)* | | *List II (Expression)* |
|---|---|---|---|
| A) | Gay Lussac's | 1) | $\frac{P_1}{T_1}=\frac{P_2}{T_2}$ |
| B) | Avogadro's Hypothesis | 2) | $\frac{r_1}{r_2}=\sqrt{\frac{M_2}{M_1}}$ |
| C) | Boyle's | 3) | $\frac{V_1}{n_1}=\frac{V_2}{n_2}$ |
| D) | Graham's law of diffusion | 4) | $\frac{P_1}{V_2}=\frac{P_2}{V_1}$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 1 | 4 | 3 | 2 |
| c) | 1 | 3 | 4 | 2 |
| d) | 4 | 3 | 2 | 1 |

27. The ratio of effusion rates of hydrogen and krypton gas
a) 1 : 4680 b) 1 : 6480 c) 1 : 8460 d) 1 : 6840

28. Equal volumes of He, $O_2$ and $SO_2$ are taken in a closed container. The ratio of partial pressures of gases He, $O_2$ and $SO_2$ .....
a) 1 : 2 : 8 b) 8 : 16 : 1 c) 1 : 4 : 16 d) 16 : 2 : 1

29. If 'Z' is a compressibility factor, Van der Waals equation at low pressures can be written as
a) $Z=1+\frac{Pb}{RT}$ b) $Z=1+\frac{RT}{Pb}$ c) $Z=1-\frac{a}{VRT}$ d) $Z=1-\frac{Pb}{RT}$

30. An ideal gas can't be liquefied because
a) its critical temperature is always above 0°C b) its molecules are relatively smaller in size
c) it solidifies before becoming a liquid
d) forces operated between its molecules are negligible

31. If the pressure and absolute temperature of 2 litres of $CO_2$ are doubled, the volume of $CO_2$ would become
a) 2 litres b) 4 litres c) 5 litres d) 7 litres

32. Maximum deviation from ideal gas is expected from
a) $CH_4(g)$ b) $NH_3(g)$ c) $H_2(g)$ d) $N_2(g)$

33. Which of the following pairs of gases will diffuse at the same time through a porus plug?
a) $CO, NO_2$ b) $NO, C_2H_6$ c) $NO_2, CO_2$ d) $NH_3, PH_3$

34. Pick out the correct relation for 1 mole of real gas
a) $\left[P+\frac{V}{a^2}\right](V-b)=RT$ b) $P=\frac{RT}{(V-b)}+\frac{a}{V^2}$
c) $\left[P+\frac{a}{V^2}\right](V-b)=RT$ d) $\left[P-\frac{a}{V^2}\right](V+b)=\frac{1}{RT}$

35. Statement I : Greater is the critical temperature, more difficult is to liquefy the gas.
Statement II : Stronger the intermolecular forces, lower would be the critical temperature of that gas
a) Both statement I and statement II are true and statement II explains statement I
b) Both statement I and statement II are true but statement II does not explain statement I
c) Statement I is true but statement II is false d) Both the statements are false

36. Match the List I and List II correctly by using the code given below.

| | *List I* | | *List II* |
|---|---|---|---|
| A) | 4s orbital | 1) | Rutherford's experiment |
| B) | $3d^6$ | 2) | 3 nodal planes |
| C) | Limitation of Bohr theory | 3) | partially filled orbital |
| D) | Existence of nucleus | 4) | multielectron atom |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 4 | 3 | 2 | 1 |
| c) | 2 | 3 | 4 | 1 |
| d) | 2 | 4 | 1 | 3 |

37. Consider the following of magnetic quantum number
i) Integral values ranging from $-\ell$ to $+\ell$ through 0.
ii) Different values of m for a given '$l$' value represent different orientation of orbitals in space
iii) The stark effect provides the experimental justification
Select the incorrect statement
a) (i) only b) (ii) only c) (iii) only d) all of these

38. Time independent Schrodinger wave equation is



a) $H\psi = E\psi$ b) $\nabla^2\psi + \frac{8\pi^2 m}{h^2}(E-V)\psi = 0$

c) $\frac{\partial^2\psi}{\partial x^2} + \frac{\partial^2\psi}{\partial y^2} + \frac{\partial^2\psi}{\partial z^2} + \frac{2m}{h^2}(E-v)\psi = 0$ d) all of these

39. The orbital angular momentum for p - electron is

a) $\sqrt{6}\frac{h}{2\pi}$ b) $\frac{h}{\sqrt{2}\pi}$ c) $\frac{h}{2\pi}$ d) $\sqrt{2}\frac{h}{\pi}$

40. ..... orbitals are possible in the 4th energy level.

a) 8 orbitals b) 10 orbitals c) 16 orbitals d) 7 orbitals

41. Effective nuclear charge ..... as the distance of orbitals ..... from the nucleus.

a) increases, decreases b) decreases, increases c) greater, less than d) none of these

42. The electronic configuration is written as .....

a) $2n^2$ b) $2(2\ell+1)$ c) $n\ell^x$ d) $n-\ell$

43. Match the List I with List II.

| List I (Orbitals) | | List II (Nodal plane) | |
|---|---|---|---|
| A) | 1s | 1) | 2 |
| B) | 3d | 2) | 3 |
| C) | 4p | 3) | 0 |
| D) | 5f | 4) | 1 |

Code :

| | A | B | C | D |
|---|---|---|---|---|
| a) | 2 | 4 | 1 | 3 |
| b) | 4 | 3 | 2 | 1 |
| c) | 1 | 2 | 3 | 4 |
| d) | 3 | 1 | 4 | 2 |

44. Assertion (A) : The angular momentum of electron must be equal to an integral multiple of $h/2\pi$.
Reason (R) : Bohr's atom model is applicable only to species having one electron.

a) (A) and (R) are true and (R) is correct explain for (A)
b) (A) and (R) are true but (R) is not correct explain for (A)
c) (A) is true and (R) are false d) (A) is false and (R) are true

45. Which of the following statements is /are incorrect?

1) Schrodinger wave equation is used to determine the probability of finding a electron at a given point in space
2) The energy of a electron at infinity is positive
3) Angular momentum quantum number gives information regarding subshells

a) 1 & 3 b) only 1 c) only 2 d) 1, 2 & 3

46. Match the List I with List II.

| List I | | List II |
|---|---|---|
| A) p - orbital | 1) | Clover leaf |
| B) s - orbital | 2) | Dumb bell with doughnut |
| C) $dz^2$ | 3) | Dumb bell |
| D) $d_{xy}$ | 4) | Spherical |

Code :

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 3 | 2 | 4 |
| b) | 4 | 3 | 1 | 2 |
| c) | 3 | 4 | 2 | 1 |
| d) | 2 | 1 | 4 | 3 |

47. ..... is maximum number of unpaired d-electrons.

a) $N^{3+}$ b) $Fe^{3+}$ c) $Zn^+$ d) $Cu^+$

48. Consider the following sets of quantum numbers

| | n | $\ell$ | m | s |
|---|---|---|---|---|
| i) | 3 | 0 | 0 | +1/2 |
| ii) | 2 | 2 | 1 | −1/2 |
| iii) | 4 | 3 | −2 | +1/2 |
| iv) | 1 | 0 | −1 | −1/2 |
| v) | 3 | 4 | 3 | −1/2 |

Which of the following set of quantum number is not possible?

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

49. The ions $O^{2-}$, $F^-$, $Na^{-1}$, $Mg^{2+}$ and $A\ell^{3+}$ are isoelectronic. Their ionic radii show

a) A decrease from $O^{2-}$ to $F^-$ and then increase from $Na^+$ to $A\ell^{3+}$
b) A significant increase from $O^{2-}$ to $A\ell^{3+}$
c) A significant decrease from $O^{2-}$ to $A\ell^{3+}$
d) An increase from $O^{2-}$ to $F^-$ and then decrease from $Na^+$ to $A\ell^{3+}$

50. Correct set of four quantum number for the valence electron of Rubidium (Z = 37) is .....

a) $5, 0, 0, -\frac{1}{2}$ b) $5, 1, 0, -\frac{1}{2}$ c) $5, 1, 1, -\frac{1}{2}$ d) $6, 0, 0, -\frac{1}{2}$



★★★★★

Name:  Section:  Reg. No.

# One Mark Test - 2

## Standard XI

## CHEMISTRY

Time : 1.00 hr. Marks : 50

50x1=50

**Choose and write the correct answer :**

1. The element with positive electron gain enthalpy is
   a) hydrogen b) sodium c) argon d) fluorine

2. ..... sets has strongest tendency to form anions. Na Mg Ar F O N
   a) Ga, In, Tℓ b) Na, Mg, Aℓ c) N, O, F d) V, Cr, Mn

3. Identify the correct order of the size of the following
   a) $Ca^{2+} < K^{+} < Ar < C\ell^{-} < S^{2-}$ b) $Ar < Ca^{2+} < K^{+} < C\ell^{-} < S^{2-}$
   c) $Ca^{2+} < Ar < K^{+} < C\ell^{-} < S^{2-}$ d) $Ca^{2+} < K^{+} < Ar < S^{2-} < C\ell^{-}$

4. Which of the following statements is true?
   a) Silicon exhibits 4 co-ordination number in its compound
   b) Bond energy of $F_2$ is less than $C\ell_2$
   c) Mn (III) oxidation state is more stable than Mn (II) in aqueous state
   d) Elements of 15th group shows only +3 and +5 oxidation states

5. The number of d-electron in $Fe^{2+}$ (Z = 26) is not equal to the number of electrons in which one of the following.
   a) d-electrons in Fe (Z = 26) b) p - electrons in Ne (Z = 10)
   c) s-electrons in Mg (Z = 12) d) p - electrons in Cℓ (Z = 17)

6. The first ionisation potential of Na is 5.1 eV. The value of electron gain enthalpy is
   a) +2.55eV b) −2.55eV c) −5.1eV d) −10.2eV

7. ..... is effective nuclear charge is minimum.
   a) Be b) $Be^{2+}$ c) $Be^{3+}$ d) All

8. Match the List I with List II.

| | List I | | List II |
|---|---|---|---|
| A) | de Chancourtois | 1) | Addition of synthetic element |
| B) | Moseley | 2) | First periodic law |
| C) | Newland | 3) | Modern periodic law |
| D) | Glenn T.Seaborg | 4) | Law of octaves |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 3 | 2 | 4 | 1 |
| c) | 2 | 3 | 4 | 1 |
| d) | 2 | 3 | 1 | 4 |

9. The first transition series is from ..... to .....
   a) Sc to Zn b) Hf to Hg c) Y to Cd d) Ac to Lr

10. Assertion (A) : He and Be have similar outer shell electronic configuration of type $ns^2$.
    Reason (R) : Both are chemically inert.
    a) (A) and (R) are true and (R) is the correct explanation of (A)
    b) (A) and (R) are true but (R) is not explanation of (A)
    c) (A) is true but (R) is false d) (A) is false but (R) is true

11. The element with atomic number 103 is
    a) Lawrencium b) Mendelevium c) Francium d) Nobelium

12. Ionic radii are
    a) Inversely proportional to square of effective nuclear charge
    b) Inversely proportional to effective nuclear charge
    c) Directly proportional effective nuclear charge
    d) Directly proportional to square of effective nuclear charge

13. Which of the following statement is incorrect?
    a) The ionization potential of nitrogen is greater than that of oxygen
    b) The ionization potential of Mg is greater than that of Aℓ
    c) The electronegativity of F is greater than that of Cℓ
    d) The electron affinity of F is greater than that of Cℓ

14. The first ionisation potential of Na, Mg and Si are 496, 737 and 786 kJ $mol^{-1}$ respectively. The ionisation potential of Al will be closer to
a) 760 kJ $mol^{-1}$ b) 575 kJ $mol^{-1}$ c) 801 kJ $mol^{-1}$ d) 419 kJ $mol^{-1}$ ☐

15. Assertion (A) : All transition elements are d-block elements, but all d-block elements are not transition elements.
Reason (R) : Zn, Cd and Hg have completely filled d-orbital.
a) Both (A) and (R) are correct and (R) is the correct explanation of (A)
b) Both (A) and (R) are correct but (R) is the not correct explanation of (A)
c) (A) is correct but (R) is wrong d) (A) is wrong but (R) is correct ☐

16. The general electronic configuration is f-block element.
a) $(n-2)f^{0,1-14}(n-1)d^{0,1-10}ns^2$ b) $(n-2)f^{1-14}(n-1)d^5ns^2$
c) $(n-2)f^{1-14}(n-1)d^{0-1}ns^2$ d) none of these ☐

17. ..... element in periodic table has highest ionisation energy
a) Li b) F c) Zn d) He ☐

18. Match the term given in column I with the equation given in column II.

| Column I | | Column - II | |
|---|---|---|---|
| A) | Enthalpy of formation | 1) | $CuSO_{4(s)} + 5H_2O_{(\ell)} \rightarrow CuSO_4.5H_2O_{(s)}$ |
| B) | Enthalpy of combustion | 2) | $CuSO_{4(s)} + nH_2O_{(\ell)} \rightarrow CuSO_{4(aq)}$ |
| C) | Enthalpy of solution | 3) | $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ |
| D) | Enthalpy of hydration | 4) | $CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(\ell)}$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 2 | 1 | 3 | 4 |
| c) | 3 | 4 | 2 | 1 |

| | A | B | C | D |
|---|---|---|---|---|
| b) | 1 | 3 | 4 | 2 |
| d) | 2 | 1 | 4 | 3 |

☐

19. Which of the following processes are accompanied by increase of entropy?
i) Dissolution of iodine in a solvent
ii) $HC\ell$ is added to $AgNO_3$ and a ppt of $AgC\ell_{(s)}$ obtained
iii) A partition is removed to allow two gases to mix
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (ii) only ☐

20. Evaporation of water is
a) An exothermic change b) An endothermic change
c) A process where no heat changes occur
d) A process accompanied by chemical reaction ☐

21. The heat of formation of CO and $CO_2$ are −26.4 kCal and −94 kCal, respectively. Heat of combustion of carbonmonoxide will be
a) +26.4 k Cal b) −67.6 k Cal c) −120.6 k Cal d) +52.8 k Cal ☐

22. Match the List I with List II.

| List I | | List II | |
|---|---|---|---|
| A) | Pressure | 1) | Intensive property |
| B) | Number of moles | 2) | Path function |
| C) | Density | 3) | Extensive property |
| D) | Work | 4) | State function |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 4 | 3 | 1 | 2 |
| c) | 4 | 3 | 2 | 1 |
| d) | 3 | 4 | 1 | 2 |

☐

23. The standard free energy change $\Delta G^\circ$ is related to equilibrium constant $K_{eq}$ as
a) $\Delta G^\circ = -2.303RT\ \ell nK_{eq}$ b) $\Delta G^\circ = 2.303RT\ \ell nK_{eq}$
c) $\Delta G^\circ = RT\ \ell nK_{eq}$ d) $\Delta G^\circ = -2.303RT\ \ell\log K_{eq}$ ☐

24. Two similar reactions are given below $H_{2(g)} + \frac{1}{2}O_{2(g)} \rightarrow H_2O_{(g)};\ \Delta H = \Delta H_1$
$H_{2(g)} + \frac{1}{2}O_{2(g)} \rightarrow H_2O_{(\ell)};\ \Delta H = \Delta H_2$. In terms of magnitude of $\Delta H$
a) $\Delta H_1 > \Delta H_2$ b) $\Delta H_1 < \Delta H_2$
c) $\Delta H_1 = \Delta H_2$ d) cannot be predicated ☐

25. The correct thermodynamic conditions for the spontaneous reaction at all temperature is
a) $\Delta H > 0, \Delta S > 0$ b) $\Delta H > 0, \Delta S < 0$ c) $\Delta H < 0, \Delta S > 0$ d) $\Delta H < 0, \Delta S < 0$ ☐

26. Heat liberated when 100 mL of 1N NaOH is neutralized by 300mL of 1N HCℓ
a) 22.92 kJ b) 57.3 kJ c) 11.46 kJ d) 5.73 kJ



27. Calculated the heat of reaction for the hydrogenation of acetylene if
i) Heat of formation of water = −68.3 k Caℓ ii) Heat of combustion of acetylene = −310.6 kCaℓ
iii) Heat of combustion of ethylene = −337.2 kCaℓ
a) −41.7 kCaℓ b) −716.1 kCaℓ c) −94.9 kCaℓ d) −26.6 kCaℓ

28. A hypothetical reaction $A \rightarrow 2B$ proceeds through the following sequence of steps
i) $A \rightarrow C;\ \Delta r\ H = q_1$ ii) $C \rightarrow D;\ \Delta r\ H = q_2$ iii) $\frac{1}{2}D \rightarrow B;\ \Delta r\ H = q_3$ The heat of hypothetical reaction is
a) $q_1 + q_2 - 2q_3$ b) $q_1 + q_2 + 2q_3$ c) $q_1 + 2q_2 - 2q_3$ d) $q_1 - q_2 + 2q_3$

29. Match the List I with List II.

| | *List I (Reaction)* | | *List II (Entropy change)* |
|---|---|---|---|
| A) | A liquid vapourises | 1) | $\Delta S = 0$ |
| B) | Non-spontaneous | 2) | $\Delta S$ = positive |
| C) | Reversible expansion of an ideal gas | 3) | $\Delta S$ = negative |

*Code :*

| | A | B | C |
|---|---|---|---|
| a) | 1 | 3 | 2 |
| b) | 3 | 1 | 2 |
| c) | 1 | 2 | 3 |
| d) | 2 | 3 | 1 |

30. For which of the following reactions will $\Delta H$ be equal to $\Delta U$?
a) $H_{2(g)} + I_{2(g)} \rightarrow 2HI_{(g)}$ b) $H_{2(g)} + \frac{1}{2}O_{2(g)} \rightarrow H_2O_{(\ell)}$
c) $2SO_{3(g)} \rightarrow 2SO_{2(g)} + O_{2(s)}$ d) $2NO_{2(g)} \rightarrow N_2O_{4(g)}$

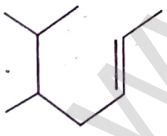
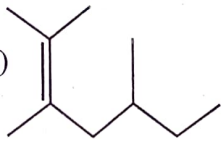
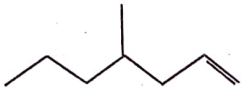
31. Pick out the wrong statement
a) The standard free energy formation of element is zero
b) A process that leads to increase in free energy will be spontaneous
c) A process accompanied decrease in entropy will be non-spontaneous under normal conditions
d) Enthalpy of combustion is always negative

32. The relation $\Delta G = \Delta H - T\Delta S$ was given by
a) Boltzmann b) Faraday c) Gibbs helmholtz d) Thomson

33. Assertion (A) : Enthalpy of neutralisation for both $HNO_3$ and HCℓ with NaOH is 57.1kJ $mo\ell^{-1}$.
Reason (R) : NaOH is a strong electrolyte.
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 the incorrect explanation of (A)
c) (A) is true but (R) is false d) (A) is false but (R) is true

34. The bond dissociation energy of methane and ethane are 360 kJ $mo\ell^{-1}$ and 620 kJ / moℓ respectively. Then the bond dissociation energy of C – C bond is
a) 170 kJ $mo\ell^{-1}$ b) 50 kJ $mo\ell^{-1}$ c) 80 kJ $mo\ell^{-1}$ d) 220 kJ $mo\ell^{-1}$

35. In an adiabatic expansion of an ideal gas
a) $W = -\Delta U$ b) $W = \Delta U + \Delta H$ c) $\Delta U = 0$ d) $W = 0$

36. Structure of the compound whose IUPAC name is, 5, 6 - dimethylehept - 2-ene is
a)  b)  c)  d) all of these

37. Which one of the following names does not fit a real name?
a) 3-methyl-3-hexanone b) 4-methyl-3-hexanone
c) 3-methyl-3-hexanol d) 2-methyl cyclo hexanone

38. $\overset{(-)}{CH_2}-\underset{\underset{O}{\|}}{C}-CH_3$ and $CH_2=\underset{\underset{O(-)}{|}}{C}-CH_3$ are
a) Resonating structure b) Tautomers c) Optical isomers d) Conformers

39. Nitrogen detection in an organic compound is carried out Lassaigne' test. The blue colour formed is due to the formation of
a) $Fe_3[Fe(CN)_6]_2$ b) $Fe_4[Fe(CN)_6]_3$ c) $Fe_4[Fe(CN)_6]_2$ d) $Fe_3[Fe(CN)_6]_3$

40. Ortho and para - nitrophenol can be separated by
a) Azeotropic distillation b) Destructive distillation
c) Steam distillation d) Cannot be separated

41. The purity of an organic compound is determined by
a) chromatography b) crystallisation c) melting or boiling point d) both (a) and (c)

42. Assertion (A) : $CH_3-\underset{\underset{COOC_2H_5}{|}}{C}=CH-COOH$ 3-carbethoxy -2- butenoic acid.

Reason (R) : The principal functional group gets lowest number followed by double bond (or) triple bond.

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 the incorrect explanation of (A)
c) (A) is true but (R) is false d) Both (A) and (R) are false

43. Considering characteristic of organic compounds.
i) Covalent compounds ii) Soluble in water
iii) High boiling and melting point iv) Exhibit isomerism
Pick out the incorrect statement.
a) (i), (ii) b) (ii), (iii) c) (iii), (iv) d) (i), (iv)

44. Match the List I and List II correctly by using the code given below.

| List I | | List II | |
|---|---|---|---|
| A) | Thioether | 1) | $-C\equiv N$ |
| B) | Thiocyanate | 2) | $-NCS$ |
| C) | Isothiocyanate | 3) | $-S-R$ |
| D) | Nitrile | 4) | $-SCN$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 3 | 4 | 2 | 1 |
| b) | 1 | 2 | 3 | 4 |
| c) | 4 | 3 | 2 | 1 |
| d) | 1 | 4 | 3 | 2 |

45. IUPAC name of $CH_3-CH_2-\underset{\underset{COOH}{|}}{CH}-CH_2-\underset{\underset{COOH}{|}}{CH}-CH_2-CH_2-CH_3$
a) 4-ethyl -2- propyl pentanedioic acid b) 5-propyl -3,5 pentanedioic acid
c) 2-ethyl-4-propyl pentanedioic acid d) none of these

46. Statement I : Saw Horse bond between two carbon atoms is drawn diagonally and slightly elongated.
Statement II : Newmann method the molecules are viewed from the front along the carbon - carbon bond axis
a) Statement I and II are correct and Statement II is correct explanation of Statement I
b) Statement I and II are correct but Statement II is not explanation of Statement II
c) Statement I is correct, II is wrong d) Statement I is wrong, II is correct

47. 0.185g of an organic compound when treated with con. $HNO_3$ and $AgNO_3$ gave 0.320g of AgBr . The % of bromine is
a) 84.6 b) 73.6 c) 82.4 d) 73.8

48. How many cyclic and acyclic isomers are possible for the molecular formula $C_3H_6O$ ?
a) 4 b) 5 c) 9 d) 10

49. Consider the statement.
i) Lassaigne's extract with acetic acid and add lead acetate solution to gives white precipitate is formed
ii) Ferricferro cyanide is blood red colour
iii) Ferric sulphocyanide is prussian blue colour
Pick out the incorrect statement.
a) (i), (ii) b) (ii), (iii) c) (i), (iii) d) all of these

50. Statement I : Column and thinlayer chromatography are based on the principle of differential adsorption.
Statement II : Animal charcoal can be added to de colorize any colored substance.
a) Statement I and II are correct and Statement II is correct explanation of Statement I
b) Statement I and II are correct but Statement II is not explanation of Statement II
c) Statement I is correct but II is wrong d) Statement is I wrong but II is correct

Name: Section: Reg. No.

# One Mark Test - 3

## Standard XI

## CHEMISTRY

Time : 1.00 hr. Marks : 50

50x1=50

**Choose and write the correct answer :**

1. The most of the compounds hydrogen exists in ..... oxidation state.
   a) +1 b) –1 c) 0 d) +2 ☐
2. Deuterium also known as .....
   a) Isotopes b) Normal hydrogen c) Heavy hydrogen d) All of these ☐
3. Match the List I with List II.

| | *List I (Isotopes)* | | *List II (Boiling point (K))* |
|---|---|---|---|
| A) | Protium | 1) | 23.67 |
| B) | Deuterium | 2) | 25.04 |
| C) | Tritium | 3) | 20.27 |

*Code :*

| | A | B | C |
|---|---|---|---|
| a) | 1 | 2 | 3 |
| b) | 3 | 1 | 2 |
| c) | 2 | 3 | 1 |
| d) | 1 | 3 | 2 |

☐

4. Para hydrogen converted into ortho hydrogen to used catalyst
   a) passing an electric discharge b) heating above 800°C
   c) platinum or iron catalyst d) all of these ☐
5. Pick out the wrong statement for preparation of hydrogen.
   a) Methane is mixed with steam and passed over A*l* catalyst in the range 800–900°C and 35 atm pressures
   b) Steam is passed over a red hot coke to produce carbon monoxide and hydrogen
   c) Zinc metal react with dilute HC*l* acid
   d) The electrolysis of aqueous solution of sodium hydroxide ☐
6. $_3Li^6 + A \rightarrow {}_2He^4 + {}_1T^3$; A is .....
   a) $_7e^0$ b) $_1e^0$ c) $_0n^1$ d) $_1H^1$ ☐
7. Lithium, sodium and calcium to give corresponding hydrides in which the oxidation state of hydrogen is .....
   a) 0 b) +2 c) +1 d) –1 ☐
8. Methanol from carbon monoxide using ..... as catalyst.
   a) Fe b) Ni c) Cu d) W ☐
9. Assertion (A) : Lead and copper decompose water only at a red hot.
   Reason (R) : Non-metal such as carbon, sulphur and phosphorous normally do not react with water.
   a) Both (A) and (R) are correct and (R) is correct explanation of (A)
   b) Both (A) and (R) are correct but (R) is not correct explanation of (A)
   c) (A) is correct but (R) is wrong d) Both (A) and (R) are wrong ☐
10. Zeolites is .....
    a) $Na_2O.MgO.XSiO_2.YH_2O$ b) $Na_2O.A\ell_2O_3.XMgO.YH_2O$
    c) $Na_2O.A\ell_2O_3.XSiO_2$ d) $Na_2O.A\ell_2O_3.XSiO_2.YH_2O$ ☐
11. A commercial sample of hydrogen peroxide marked as '100 volume' $H_2O_2$, it means that
    a) 1 m*l* of $H_2O_2$ will give 100m*l* $O_2$ at STP b) 1 L of $H_2O_2$ will give 100m*l* $O_2$ at STP
    c) 1 L of $H_2O_2$ will give 22.4 L $O_2$
    d) 1m*l* of $H_2O_2$ will give 1mole of $O_2$ at STP ☐
12. Water is a
    a) basic oxide b) acidic oxide c) amphoteric oxide d) none of these ☐
13. Select the correct statement
    a) Temporary hardness is due to dissolved bicarbonates of $Ca^{2+}$ and $Mg^{2+}$
    b) Permanent hardness is due to dissolved sulphates and chlorides of $Ca^{2+}$ and $Mg^{2+}$
    c) Hardness can be removed by Clark's method d) All of the above ☐
14. Ionic hydrides are usually
    a) Good conductors of electricity in solid state b) Volatile
    c) Non-crystalline d) Stoichiometric compounds ☐

15. The dihedral angle of $H_2O_2$ is gas and solid phase is .....
a) 111.5° and 90.2° b) 115.1° and 92° c) 92° and 115.1° d) 90.2° and 115° ☐

16. Match the List I with List II.

| List I | | List II | |
|---|---|---|---|
| A) | $H_2O_2$ | 1) | $SiH_4$ |
| B) | $D_2O$ | 2) | PdH |
| C) | Metallic hydride | 3) | Bleach |
| D) | Molecular hydride | 4) | Study of reaction mechanism |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 3 | 2 | 4 |
| b) | 4 | 3 | 2 | 1 |
| c) | 3 | 4 | 2 | 1 |
| d) | 2 | 1 | 4 | 3 |

☐

17. Macmillan Guldberg and Peter Waage formulated .....
a) Le Chatelier principle b) Van't Hoff equation c) Law of mass action d) None of these ☐

18. $\frac{K_c}{K_p}$ for the reaction $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$ is
a) $\frac{1}{RT}$ b) $\sqrt{RT}$ c) RT d) $(RT)^2$ ☐

19. In which the following $K_p < K_c$ ?
a) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$ b) $PC\ell_{5(g)} \rightleftharpoons PC\ell_{3(g)} + C\ell_{2(g)}$
c) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$ d) $N_2O_{5(g)} \rightleftharpoons 2NO_{2(g)} + O_{(g)}$ ☐

20. In the following equilibrium reaction $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$; $\Delta H = +59.0\,kJ\ mole^{-1}$ the formation of $NO_2$ is more favoured when
a) pressure and temperature increase b) pressure increase
c) temperature decrease
d) pressure decreases and temperature decrease ☐

21. Consider the following equilibrium reactions and relate their equilibrium constants
i) $N_2 + O_2 \rightleftharpoons 2NO$; $K_1$ ii) $2NO + O_2 \rightleftharpoons 2NO_2$; $K_2$ iii) $N_2 + 2O_2 \rightleftharpoons 2NO_2$ ; $K_3$ The relation is
a) $K_1 = \frac{K_2}{K_3}$ b) $K_2 = K_1 \times K_3$ c) $K_2 = K_3$ d) $K_3 = K_1 \times K_2$ ☐

22. Which one of the following reaction is almost completed?
i) $2H_2O_{(g)} \rightleftharpoons 2H_{2(g)} + O_{2(g)}$; $K_c = 4.1 \times 10^{-48}$
ii) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$; $K_c = 57.0$
iii) $2CO_{(g)} + O_{2(g)} \rightleftharpoons 2CO_{2(g)}$; $K_c = 2.2 \times 10^{22}$
a) (i) only b) (ii) only c) (iii) only d) all of these ☐

23. Which of the following equilibrium affected by pressure?
i) $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ ii) $PC\ell_{3(g)} + C\ell_{2(g)} \rightleftharpoons PC\ell_{5(g)}$ iii) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$
a) (i) & (ii) b) (ii) & (iii) c) (i) & (iii) d) (i), (ii) and (iii) ☐

24. For the reaction $SrCO_{3(s)} \rightleftharpoons SrO_{(s)} + CO_{2(g)}$. The value of equilibrium constant $K_p = 2.2 \times 10^{-4}$ at 1002K. The $K_c$ is .....
a) $2.674 \times 10^{6}$ b) $6.274 \times 10^{6}$ c) $2.674 \times 10^{-6}$ d) $6.274 \times 10^{-6}$ ☐

25. The value of $K_c$ for $N_2 + 3H_2 \rightleftharpoons 2NH_3$ is 10 mol/lit. The value of $K_c^1$ for the given equilibrium $2N_2 + 6H_2 \rightleftharpoons 4NH_3$
a) 10 b) 1 c) 0 d) 100 ☐

26. Assertion (A) : Ice melts slowly at higher altitude.
Reason (R) : At high altitude atmospheric pressure is high and therefore ice melts slowly.
a) Both (A) and (R) are correct and (R) is correct explanation of (A)
b) Both (A) and (R) are correct but (R) is not correct explanation of (A)
c) (A) is correct but (R) is wrong d) (A) is wrong but (R) is correct ☐

27. Match the List I with List II.

| List I ($K_c$ values) | | List II (extend of a reaction) | |
|---|---|---|---|
| A) | Large value of $K_c$ | 1) | reaction rarely proceeds |
| B) | Low value of $K_c$ | 2) | low product yield |
| C) | $K_c > 10^3$ | 3) | high product yield |
| D) | $K_c < 10^{-3}$ | 4) | nearly to completion |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 4 | 2 | 3 | 1 |
| c) | 4 | 3 | 2 | 1 |
| d) | 3 | 2 | 4 | 1 |

☐

28. The values of $Kp_1$ and $Kp_2$ for the reactions $X \rightleftharpoons Y + Z$ $A \rightleftharpoons 2B$ are in the ratio 9 : 1 if degree of dissociation and initial concentration of X and A be equal then total pressure at equilibrium $P_1$ and $P_2$ are in the ratio
a) 36 : 1 b) 1 : 1 c) 3 : 1 d) 1 : 9 ☐

29. Solubility of carbondioxide gas in cold water can be increased by
a) increase in pressure b) decrease in pressure c) increase in volume d) none of these ☐

30. The contact process of manufacturing $SO_3$ ..... is used as a catalyst.
a) Iron b) Platinum c) $V_2O_5$ d) Pt or $V_2O_5$ ☐

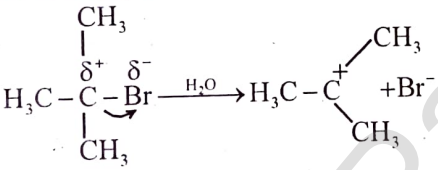
31. ..... is used to explain such gas - solution equilibrium processes.
a) Law of mass action b) Le-Chatelier principle c) Hess law d) Henry's law ☐

32. Consider the following statement
i) If $Q = K_c$ the reaction is non equilibrium state ii) If $Q > K_c$ the reaction is reverse direction
iii) If $Q < K_c$ the reaction is forward direction
Pick out the wrong statement.
a) (i) & (ii) b) (ii) & (iii) c) (i) only d) (ii) only ☐

33. Integrated form of Van't Hoff equation
a) $\frac{d(\ell nK)}{dt} = \frac{\Delta H^0}{RT^2}$ b) $\ell nK = \frac{-\Delta H^0}{RT} + \frac{\Delta S^0}{R}$
c) $\ell og \frac{K_2}{K_1} = \frac{\Delta H^0}{2.303R}\left(\frac{T_1 - T_2}{T_1 T_2}\right)$ d) $\ell og \frac{K_2}{K_1} = \frac{\Delta H^0}{2.303R}\left(\frac{T_2 - T_1}{T_2 T_1}\right)$ ☐

34. Consider the following reversible reaction at equilibrium $A + B \rightleftharpoons C$, if the concentration of the reactants A and B are doubled, then the equilibrium constant will
a) be doubled b) become one fourth c) be halved d) remain the same ☐

35. ..... is optically active
a) 2-methyl pentane b) Citric acid c) Glycerol d) None of these ☐

36. 
This equation is example of .....
a) Homolytic cleavage b) Heterolytic cleavage
c) Hyperconjugation d) Electromeric effect ☐

37. Decreasing order of –I effect group
a) $NH_3^+ > C_6H_5 > F > SO_3H$ b) $C_6H_5 > SO_3H > F > NH_3^+$
c) $NH_3^+ > SO_3H > F > C_6H_5$ d) $F > SO_3H > NH_3^+ > C_6H_5$ ☐

38. Which of the following is correct?
a) n - propyl bromide to react with alcoholic KOH gives propyne
b) $\pi$ electron is transferred towards the attacking reagent is called –E effect
c) The electron move away from substituent attached to the conjugated system is called –M effect
d) The electron move towards the substituent attached to the conjugated system is called –M effect ☐

39. Statement I : Electrophiles are reagents that are attracted towards negative charge or electron rich center.
Statement II : All Lewis acids act as nucleophiles.
a) Statement I and II are true and Statement II is correct explanation of I
b) Statement I and II are true and Statement II is not correct explanation of I
c) Statement I is true but Statement II is wrong
d) Statement I is wrong but Statement II is true ☐

40. Assertion (A) : The inductive effect does not transfer electrons from one atom to another atom.
Reason (R) : I effect the ability of particular atom to either withdraw or donate electron density to the attached carbon.
a) Both (A) and (R) are correct and (R) is correct explanation of (A)
b) Both (A) and (R) are correct but (R) is not correct explanation of (A)
c) (A) is correct but (R) is wrong d) (A) is wrong but (R) is correct ☐

41. Match the List I with List II.

| List I | | List II | |
|---|---|---|---|
| A) | Nucleophiles | 1) | $FeCl_3$ |
| B) | Electrophiles | 2) | $-CH(CH_3)_2$ |
| C) | Neutral | 3) | $+NO_2$ |
| D) | +I effect | 4) | $CN^-$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 4 | 3 | 2 | 1 |
| c) | 2 | 3 | 1 | 4 |
| d) | 4 | 3 | 1 | 2 |

42. The acidity of various chloro acetic acid is in the following correct order.

a) $CHCl_2COOH > CH_2ClCOOH > CCl_3COOH$

b) $CCl_3COOH < CH_2ClCOOH < CHCl_2COOH$

c) $CCl_3COOH > CHCl_2COOH > CH_2ClCOOH$

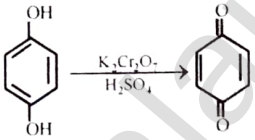
d) None of these

43. For the following reactions

A) $CH_3-CH_2-CH_2-Br \xrightarrow[KOH]{\text{alcoholic}} CH_3-CH=CH_2+H_2O+Br^-$

B) $H_2C=\underset{H}{\underset{|}{C}}-\ddot{C}l: \leftrightarrow H_2\bar{C}-\underset{H}{\underset{|}{C}}=\overset{+}{C}l:$

C) $CN^- + C=O \rightarrow NC-\underset{\ddot{}}{\bar{C}}:$

D) 

Which of the following statement is correct?

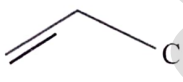
a) (A) is Hyperconjugation (B) is Elimination (C) Electromeric (D) Oxidation

b) (A) Electromeric (B) Oxidation (C) Elimination (D) Hyperconjugation

c) (A) Elimination (B) Hyperconjugation (C) Electromeric (D) Oxidation

d) None of these

44. ..... is most reactive towards nucleophilic substitution reaction.

a)  b)  c)  d) 

45. The hybridisation state of benzyl carbonium ion

a) $sp^2$ b) $spd^2$ c) $sp^3$ d) $sp^2d$

46. Fruits contains antioxidants which ..... the effect of free radicals.

a) Increase b) Same c) Decrease d) None of these

47. ..... species does not exert a resonance effect.

a) $C_6H_5OH$ b) $C_6H_5Cl$ c) $C_6H_5NH_2$ d) $C_6H_5\overset{+}{N}H_3$

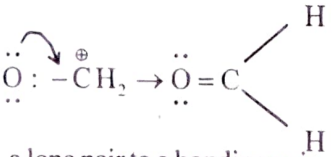
48. Aliphatic nucleophilic substitution reactions take places ..... mechanism.

a) $SN^1$ b) $SN^2$ c) $SN^1$ or $SN^2$ d) None of these

49. $H_2C=CH_2+H-Br \xrightarrow{\text{Benzoyl Peroxide}} CH_3-CH_2-Br$ above reaction. Benzoyl peroxide acts as a .....

a) catalyst b) radical initiator

c) addition reactant d) all of these

50.  This reaction type is

a) a lone pair to a bonding pair b) a bonding pair to a lone pair

c) a bonding pair to an another bonding pair d) a lone pair to becomes another lone pair

★★★★★

Name: Section: Reg. No.



# One Mark Test - 4

## Standard XI
## CHEMISTRY

Time : 1.00 hr. Marks : 50

50x1=50

**Choose and write the correct answer :**

1. The atomic and ionic radii of alkali metals ..... on moving down the group.
   a) increases b) decreases
   c) does not vary d) decreases and then increases

2. The correct increasing order of density of alkali metals is
   a) Li < K < Na < Cs < Rb b) K < Li < Rb < Na < Cs
   c) Li < K < Na < Rb < Cs d) Cs < Rb < K < Na < Li

3. Select the correct statement.
   a) Lithium carbonate is soluble in water b) Potassium carbonate is soluble in water
   c) Barium carbonate is soluble in water d) Bicarbonate of lithium is soluble in water

4. Assertion (A) : The first ionisation energies of alkaline earth metals are higher than alkali metals.
   Reason (R) : Because increase in nuclear charge of the alkaline earth metals.
   a) Both (A) and (R) are correct and (R) is correct explanation of (A)
   b) Both (A) and (R) are correct but (R) is not correct explanation of (A)
   c) (A) is correct but (R) is wrong d) Both (A) and (R) are wrong

5. Potassium super oxide is used in oxygen cylinder in space and submarine because it
   a) absorbs $CO_2$ and increase $O_2$ constant b) eliminates moisture
   c) absorbs $CO_2$ d) produces $O_2$

6. In the Castner - Kellner cell used for the manufacture of NaOH, the cathode in the central compartment is made of
   a) Iron b) Carbon c) Mercury d) Steel vessel

7. The compound called microcosmic salt is
   a) $Na_2HPO_4.2H_2O$ b) $Na(NH_4)HPO_4.H_2O$
   c) $Na_2NH_4PO_4.2H_2O$ d) $(NH_4)_2HPO_4.2H_2O$

8. Beryllium and aluminium exhibit many properties which are similar. But the two elements differ in
   a) exhibiting maximum covalency in compounds b) forming polymeric hydrides
   c) forming covalent halides
   d) exhibiting amphoteric nature in their oxides

9. Match the List I with List II.

| | *List I (substances)* | | *List II (composition)* |
|---|---|---|---|
| A) | Plaster of paris | 1) | $CaSO_4.2H_2O$ |
| B) | Epsomite | 2) | $CaSO_4.\frac{1}{2}H_2O$ |
| C) | Kieserite | 3) | $MgSO_4.7H_2O$ |
| D) | Gypsum | 4) | $MgSO_4.H_2O$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 3 | 4 | 1 | 2 |
| b) | 2 | 3 | 4 | 1 |
| c) | 1 | 2 | 3 | 4 |
| d) | 4 | 3 | 2 | 1 |

10. Pick out the wrong statement.
    i) Potassium and cesium have much lower ionization enthalpy than that of lithium
    ii) NaOH & KOH are highly deliquescent
    iii) $LiC\ell O_4$ is 12 times less soluble than $NaC\ell O_4$
    iv) The alkaline earth metals hydroxides are less basic and less stable than alkali metals
    a) (i) & (ii) b) only (iii) c) only (iv) d) (i), (ii), (iii) and (iv)

11. Identify, the correct statement about barium
i) It shows photo electric effect ii) It is silvery white metal
iii) It forms $Ba(NO_3)_2$. Which is used in preparation of green fire
a) (i) & (iii) b) (ii) & (iii) c) only (ii) d) (i), (ii) & (iii) ☐

12. ..... is insoluble in water.
a) $CaC\ell_2$ b) $HgC\ell_2$ c) $Ca(NO_3)_2$ d) $CaF_2$ ☐

13. ..... does not give flame colouration.
a) $BaC\ell_2$ b) $CaCO_3$ c) $SrCO_3$ d) $MgC\ell_2$ ☐

14. ..... activate many enzymes, participate in the oxidation of glucose to produce ATP.
a) Lithium ion b) Sodium ion c) Potassium ion d) Calcium ion ☐

15. $Be(OH)_2 + 2HC\ell + 2H_2O \rightarrow X$ X is .....
a) $BeC\ell_2$ b) $[Be(H_2O)_4]$ c) $[Be(OH)_4]\,C\ell_2$ d) $[BeC\ell_4]$ ☐

16. Match the List I with List II.

| | List I | | List II |
|---|---|---|---|
| A) | Blue John | 1) | $Na_2CO_3NaHCO_3.2H_2O$ |
| B) | Dead burnt plaster | 2) | KOH |
| C) | Trona | 3) | $CaSO_4$ |
| D) | Lye | 4) | $CaF_2$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 4 | 3 | 2 | 1 |
| b) | 1 | 2 | 3 | 4 |
| c) | 4 | 2 | 1 | 3 |
| d) | 3 | 1 | 4 | 2 |

☐

17. Chlorhexidine mouthwash solution contains .....
a) 3% (w / v) chlorhexidine gluconate b) 6% (w / v) chlorhexidine gluconate
c) 0.2% (w / v) chlorhexidine gluconate d) 8% (w / v) chlorhexidine gluconate ☐

18. Match the List I with List II.

| | List I | | List II |
|---|---|---|---|
| A) | Molality | 1) | $\frac{\text{No of gram equivalents of solute}}{\text{Volume of solution (in L)}}$ |
| B) | Molarity | 2) | $\frac{\text{No of formula weight of solute}}{\text{Volume of solution (inL)}}$ |
| C) | Normality | 3) | $\frac{\text{No of moles of solute}}{\text{Mass of the solvent (in Kg)}}$ |
| D) | Formality | 4) | $\frac{\text{No of moles of solute}}{\text{Volume of the solution (in L)}}$ |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 3 | 4 | 1 | 2 |
| c) | 4 | 3 | 2 | 1 |
| d) | 2 | 1 | 4 | 3 |

☐

19. Neomycin, aminoglycoside antibiotic cream contains 300mg of neomycin sulphate the active ingredient, in 30g of ointment base. The mass percentage of neomycin is ..... (w/w).
a) 10% b) 0.1% c) 1% d) 0.01% ☐

20. Assertion (A) : An ideal solution obey's Raoults law.
Reason (R) : In an ideal solution, solvent - solvent as well as solute - solute interactions are similar to solute - solvent interaction.
a) Both (A) and (R) are correct and (R) is correct explanation of (A)
b) Both (A) and (R) are correct but (R) is not correct explanation of (A)
c) (A) is correct but (R) is wrong
d) Both (A) and (R) are wrong ☐

21. An aqueous solution of 2% nonvolatile solute exerts a pressure of 1.004 bar at the boiling point of the solvent. The molar mass of the solute when $P_A^0$ is 1.013 bar .....
a) 41.3 Kg mo$\ell^{-1}$ b) 14.3 g mo$\ell^{-1}$ c) 41.3 g mo$\ell^{-1}$ d) 14.3 Kg mo$\ell^{-1}$ ☐

22. The elevation of boiling point is ..... to the concentration of the solute particles.
a) inversely proportional b) directly proportional
c) constant d) equal ☐

23. The osmotic pressure of the blood cells is approximately equal to .....
a) 7atm at 25°C b) 70atm at 37°C c) 70atm at 25°C d) 7atm at 37°C ☐

24. Consider the following statement.
i) The relative lowering of vapour pressure depends only on the mole fraction of the solute and is independent of its nature
ii) A solution deviates from Raoults law at high pressure
iii) Only the more soluble gases obey Henry's law
iv) The carbonated drinks are stored in a pressurized container
Pick out the incorrect statement.
a) (i) only b) (ii) & (iii) c) (iii) only d) only (iv) ☐

25. Which one of the following binary liquid mixtures exhibits negative deviation from Raoults law?
a) Acetone + Chloroform b) Benzene + Acetone
c) Acetone + Ethyl alcohol d) Ethyl alcohol + Water ☐

26. Relative lowering of vapour pressure
a) $\frac{p^0 - p}{p^0} = i\,\frac{n_{solvent}}{n_{solute}}$ b) $\frac{p^0_{solvent} - p_{solution}}{p^0_{solvent}} = \frac{n_{solute}}{n_{solvent}}$
c) $\Delta Tb = iK_b m$ d) $T_i = i\,\frac{W_{solute}}{V}\,\frac{RT}{M_{solute}}$ ☐

27. Which one of the lowest molal freezing point depression constant?
a) Benzene b) Acetic acid c) Ethanol d) Ether ☐

28. 2.82g of glucose is dissolved in 30g of water. The mole fraction of glucose and water are .....
a) 0.1 b) 0.01 c) 1 d) 10 ☐

29. ..... aqueous solutions has the highest boiling point.
a) 0.1 M $KMnO_3$ b) 0.1M $Na_3PO_4$ c) 0.1 M $BaC\ell_2$ d) 0.1M $K_2SO_4$ ☐

30. Ammonia is ..... oxygen in water.
a) Less soluble than b) non soluble c) more soluble than d) soluble ☐

31. Assertion (A) : Add ethylene glycol to water in car radiator while driving in hill station.
Reason (R) : Ethylene glycol lower the freezing point of a water, therefore, water does not freeze in hill station.
a) Both (A) and (R) are correct and (R) is correct explanation of (A)
b) Both (A) and (R) are correct but (R) is not correct explanation of (A)
c) (A) is correct but (R) is wrong d) Both (A) and (R) are wrong ☐

32. The value of Van't Hoff factor for a dilute solution of $K_2SO_4$ in water .....
a) 1 b) 2 c) 3 d) 4 ☐

33. The correct arrange the following in the increasing order of solubility.
a) $CH_3CN < KC\ell < CH_3OH <$ Cyclohexane b) $KC\ell < CH_3OH < CH_3CN <$ Cyclohexane
c) Cyclohexane $< CH_3CN < CH_3OH < KC\ell$ d) $CH_3OH <$ Cyclohexane $< KC\ell < CH_3CN$ ☐

34. The similarity between Raoult's and Henry's law
a) Both the laws are applied to volatile component in solution
b) Both laws state that the vapour pressure is inversely proportional to mole fraction
c) Solvent obeys Raoult's law and solute obeys Henry's law
d) All of these ☐

35. Osmotic pressure ($\pi$) of a solution is given by the relation
a) $\pi = nRT$ b) $\pi V = nRT$ c) $\pi RT = n$ d) $\pi = RT$ ☐

36. The order of reactivity of halo acids with alcohol is in the order .....
a) $HC\ell > HBr > HI$ b) $HBr > HC\ell > HI$ c) $HI > HBr > HC\ell$ d) $HBr < HI > HC\ell$ ☐

37. Match the List I with List II

| List I (Compound) | | List II (π - electrons) | |
|---|---|---|---|
| A) | Benzene | 1) | 2 |
| B) | Naphthalene | 2) | 14 |
| C) | Anthracene | 3) | 10 |
| D) | Cyclopropenyl | 4) | 6 |

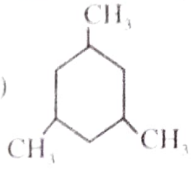
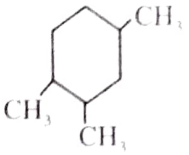
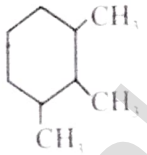
*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 4 | 2 | 1 | 3 |
| b) | 1 | 2 | 3 | 4 |
| c) | 3 | 1 | 4 | 2 |
| d) | 4 | 3 | 2 | 1 |

38. Acetylene on passing through a red hot tube trimerises to give
a) ethylene b) benzene c) mesitylene d) toluene

39. The addition of H – Br to an alkene in the presence of organic peroxide gives the anti Markownikoff's product. This effect is called
a) Peroxide effect b) Halogenation effect
c) Free radical formation effect d) Kharasch addition

40. $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{|}}{C} = CH_2 \xrightarrow{A} CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{|}}{C} = O$ where A is
a) Zn b) Con $H_2SO_4$ c) Alc.KOH d) Acidified $KMnO_4$

41. Propyne on passing through red hot iron tube gives
a)  b)  c)  d) none of these

42. Cold dilute alkaline $KMnO_4$ solution is
a) Lucas reagent b) Grignard reagent c) Baeyer's reagent d) Fenton's reagent

43. HCl bond is ..... H – Br Bond.
a) Weaker than b) Stronger than c) Same d) None of these

44. Cumene is .....
a) isopropyl benzene b) isopropyl toluene
c) isopropyl pentane d) 1,4-dimethyl benzene

45. Assertion (A) : Benzene undergoes electrophilic substitution reaction.
Reason (R) : Because it is an electron - rich system due to delocalised π electron. Easily attacked by electrophilies
a) Both (A) and (R) are correct and (R) is correct explanation of (A)
b) Both (A) and (R) are correct but (R) is not correct explanation of (A)
c) (A) is correct but (R) is wrong d) Both (A) and (R) are wrong

46. Ethyne forms linear polymer, when passed into a solution of .....
a) $Hg^{2+}$ / $H^+$ b) $AgNO_3$ / $HNO_3$
c) Alcoholic KOH d) Cuprous chloride/ $NH_4Cl$

47. IUPAC name of o-xylene
a) 1, 3 - dimethyl benzene b) 1, 2 - dimethyl benzene
c) 1, 4 - dimethyl benzene d) none of these

48. ..... is used in welding and cutting metal.
a) Acetylene b) Propyne c) Oxy acetylene d) Butyne

49. Match the List I with List II.

| List I | | List II | |
|---|---|---|---|
| A) | Crude light oil | 1) | Naphthalene |
| B) | Middle oil | 2) | Cresol |
| C) | Heavy oil | 3) | Xylene |
| D) | Green oil | 4) | Anthracene |

*Code :*

| | A | B | C | D |
|---|---|---|---|---|
| a) | 2 | 4 | 1 | 3 |
| b) | 4 | 3 | 2 | 1 |
| c) | 3 | 1 | 2 | 4 |
| d) | 1 | 2 | 3 | 4 |

50. Consider the following statements:
i) Benzene is a colourless liquid ii) Benzene vapours are highly toxic
iii) Benzene react with hydrogen in the presence of Pt to yield n-hexane
iv) Benzene react with $O_2$, $V_2O_5$ at 773K to gives acetic anhydride
Pick out the incorrect statements.
a) (i) & (ii) b) (ii) & (iii) c) (iii) & (iv), (i) d) (iii) & (iv)