# Higher Secondary School Main Exam - 2024

## Subject – Chemistry

## Class – XII

**Time Allowed: 3 hours** **Maximum Marks: 70**

**Instructions:**

**1.** All questions are compulsory.

**2.** Question Nos. 1 to 5 are objective type questions carry total 28 marks.

**3.** Question Nos. 6 to 12, each question carries 2 marks. (30 words)

**4.** Question Nos. 13 to 16, each question carries 3 marks. (75 words)

**5.** Question Nos. 17 to 20, each question carries 4 mark (word limit 120 words)

**6.** Internal choice is given in every question from Question Nos. 6 to 20.

### SECTION – A

**1. Choose and write correct options :** **(1 × 6 = 6)**

**(a)** A first order reaction completes 75% in 16 minutes. How much time will it take to complete 50%?

(i) 8 minutes (ii) 32 minutes

(iii) 24 minutes (iv) 4 minutes

**(b)** The following enzyme decompose maltose into glucose.

(i) Invertase (ii) Zymase

(iii) Maltase (iv) Urease

**(c)** The nature of α-hydrogen in aldehydes is

(i) Acidic (ii) Basic

(iii) Neutral (iv) Amphoteric

**(d)** 5 gram NaOH is dissolved in 250 ml of solution. The molarity of solution will be

(i) 0.5 M (ii) 0.25 M

(iii) 2.5 M (iv) 5.0 M

**(e)** The unit of cell constant is

(i) ohm cm (ii) $cm^{-1}$

(iii) cm (iv) $ohm^{-1}\ cm^{-1}$

**(f)** Isomerism exhibited by the complex compound $[Co(NH_3)_5(Cl)]SO_4$ and $[Co(NH_3)_5(SO_4)]Cl$ is

(i) Bond isomerism (ii) Hydrate isomerism

(iii) Co-ordination isomerism (iv) Ionisation isomerism

**2. Fill in the blanks :** **(1 × 6 = 6)**

**(i)** E.D.T.A. is a ____ ligand.

**(ii)** 2, 4, 6 trinitrophenol is called ____.

**(iii)** $C_6H_5COOH$ + ____ $C_6H_5CONH_2 + H_2O$.

**(iv)** Methyl amine is ____ acidic than ethyl amine.

**(v)** The solubility of gas in a liquid is determined by ____ law.

**(vi)** One Faraday electricity equals to ____ coulomb.

**3. Write True or False :** **(1 × 6 = 6)**

**(i)** Primary amines is prepared by Hoffmann bromamide reaction.

**(ii)** Keratin is a globular proteins.

**(iii)** Ketones is prepared by Stephen reaction.

**(iv)** The unit of rate of reaction is mol $lit^{-1}$ $sec^{-1}$.

**(v)** Lanthanoids is more reactive than actinoids.

**(vi)** Phenols is also called carbolic acids.

**4. Match the pairs correctly :** **(1 × 5 = 5)**

| **"A"** | **"B"** |
|---|---|
| **(i)** Vitamin "D" | (a) $C_6H_5SO_2Cl$ |
| **(ii)** Diazonium salts | (b) Keratin |
| **(iii)** Hinsberg's reagent | (c) $C_6H_5NH_2$ |
| **(iv)** Vitamin "$B_{12}$" | (d) Rickets |
| **(v)** Protein | (e) $C_6H_5N_2Cl$ |
| | (f) Cobalt |

**5.** Answer in one word/sentence : **(1 × 5 = 5)**

**(i)** Write the unit of Equivalence conductivity.

**(ii)** Write the general electronic configuration of f-block elements.

**(iii)** Who propounded the theory of Coordination compounds?

**(iv)** Write the definition of Formalin.

**(v)** Write the definition of Molality.

**6.** Write the definition of complex ion. **(2)**

**OR**

Write the ionisation isomerism with example.

**7.** Write any two uses of D.D.T. **(2)**

**OR**

Write any two uses of carbon tetrachloride.

**8.** Write Ammonolysis of alkyl halides with chemical equation. **(2)**

**OR**

Write coupling reaction of Diazonium salt with chemical equation.

**9.** Write the definition of Resistivity. **(2)**

**OR**

Write the definition of specific conductivity.

**10.** Write the definition of rate of chemical reaction. **(2)**

**OR**

Write the definition of molecularity of chemical reaction.

**11.** Transition metals show changed oxidation number, why? Write cause. **(2)**

**OR**

Transition metals form coloured ions/compounds, why? Write cause.

**12.** Write the IUPAC name of following complex compounds - **(2)**

(i) $K_2[Hg(I)_4]$

(ii) $[Cr(H_2O)_6]Cl_3$

**OR**

Write the IUPAC name of following coordination compounds –

(i) Potassium Tetrahydroxydo Zincate (II)

(ii) Tetracarbonilnikel (O)

**13.** Write following chemical reactions with chemical equations : **(3)**

(i) Reaction of phenols with sodium (acidic nature)

(ii) Reimer-Tiemann reaction.

**OR**

Write chemical equation for the following conversions :

(i) Propene to Propan-2-ol

(ii) Benzyl chloride to Benzyl alcohol

**14.** Write the definition of enzyme with example. **(3)**

**OR**

Write the following of essential and non-essential amino acids with example.

**15.** For a first order reaction, write that time required for 99% completion is twice the time required for the completion of 90% of reaction. **(3)**

**OR**

For a zero order of chemical reaction, derive the expression that the value of half life ($t_{1/2}$) is directly proportional of the initial concentration of reactants.

**16.** Write the definition of d-block elements and its any two characters. **(3)**

**OR**

Write the definition of f-block elements and its any two characters.

**17.** Write the following reactions with chemical equations : **(4)**

(i) Oxidation of chloroform

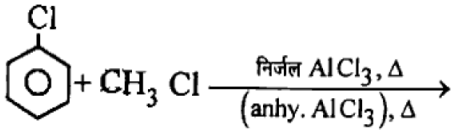
(ii) Wurtz-Fittig reaction

**OR**

Complete following reactions :

(i) $CH_3CH_2Br + KCN \xrightarrow[(aq.\ ethanol)]{\text{जलीय एथेनॉल}}$

(ii) $C_2H_5Cl + C_2H_5ONa \rightarrow$

(iii)  $+ CH_3Cl \xrightarrow[(anhy.\ AlCl_3),\ \Delta]{\text{निर्जल } AlCl_3,\ \Delta}$

(iv) $CH_3CH_2OH + SOCl_2 \rightarrow$

**18.** Write the following reactions with chemical equations : **(4)**

(i) Cannizaro's reaction

(ii) Rosenmund reaction

**OR**

What happened, when (Write with chemical equations)

(i) Benzene is reacted with acetyl chloride in the presence of anhydrous aluminium chloride catalyst.

(ii) Benzene is heated with carbon monoxide and hydrogen chloride gas in the presence of anhydrous aluminium chloride catalyst.

**19.** Define Osmotic pressure and based on this derive a mathematical expression to determine the molecular weight (mass) of solute. **(4)**

**OR**

Define depression in freezing point and based on this derive a mathematical expression to determine the molecular weight (mass) of solute.

**20.** Write Kohlrausch's law and its any two applications. **(4)**

**OR**

Write any four differences between galvanic cell and electrolytic cell.

***** End *****