

SAMPLE PAPER-2

Class-XII

Subject- Chemistry

Time: 3 hours

Max. Marks: 70

General Instructions:-

- All questions are compulsory.
- Question nos. 1 to 8 are very short answer questions and carry 1 mark each.
- Question nos. 9 to 18 are short answer questions and carry 2 marks each.
- Question nos. 19 to 27 are also short answer questions and carry 3 marks each.
- Question nos. 28 to 30 are long answer questions and carry 5 marks each.
- Use log tables if necessary, use of calculators is not allowed.

1	Write IUPAC name of the following:- $\begin{array}{c} \text{O} \\ \\ \text{CH}_3\text{-C-CH}_2\text{-COOH} \end{array}$ (i) $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3\text{-C-CH}_2\text{-CH}_2\text{-COOH} \\ \\ \text{COOH} \end{array}$ (ii)	1
2	What is the effect of Frenkel defect on the electrical conductance of a crystalline solid?	1
3	What happens to silicon (group-14) when it is doped with gallium (group-13)?	1
4	What is meant by molecularity of a reaction?	1
5	Which of the following pair will react faster towards nucleophilic substitution reaction; (a) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{Cl}$ and $\text{CH}_2 = \text{CH} - \text{Cl}$ (b) Phenol and cyclohexanol.	1
6	In the test for Cl^- , $\text{K}_2\text{Cr}_2\text{O}_7$ (solid) and conc. H_2SO_4 is added. Reddish brown vapours of a compound 'X' are formed. Identify the compound 'X'.	1
7	What do you mean mutarotation?	1
8	Predict the shape of BrF_5 on the basis of VSEPR theory.	1
9	An element 'A' crystallizes in fcc structure. 200 g of this element has 4.12×10^{24} atoms. The density of 'A' is 7.2 g cm^{-3} . Calculate radius of the element.	2
10	Calculate the e.m.f. of the following cell at 298 K : $\text{Sn(s)} / \text{Sn}^{2+} (0.05\text{M}) // \text{H}^+ (0.02\text{M}) / \text{H}_2 (1 \text{ atm}) / \text{Pt}$. $E^\circ_{\text{Sn}^{2+}/\text{Sn}} = -0.136 \text{ V}$.	2
11	(a) Explain why deltas are formed where river and sea water meet.	1
	(b) Compare lyophilic and lyophobic colloidal solutions in terms of stability and reversibility.	1
12	(a) Why is Fe(OH)_3 sol is positively charged?	1

	(b)	What are micelles? How do they differ from ordinary colloidal particles?	1
13	(a)	Why is HI stronger acid than HF?	1
	(b)	KHF ₂ exists whereas KCl ₂ does not, why?	1
		OR	
		When conc. H ₂ SO ₄ was added to an unknown salt present in test tube, a brown gas 'A' was evolved. The gas did not intensify on adding a piece of paper. When AgNO ₃ (aq) was added to salt solution, a yellow ppt. partially soluble in excess of NH ₄ OH was formed. Identify unknown salt and gas 'A'. Write all the reactions involved.	2
14		Arrange the following in order of increasing order of acidic character giving reason; Phenol, Benzoic acid, Formic acid and Chloroacetic acid.	2
15		How will you convert: (a) Toluene to m-nitrobenzoic acid (b) Aniline to benzene	2
16		Complete and balance the following reactions: (i) HNO ₃ + P ₄ O ₁₀ → (ii) IO ₃ ⁻ + I ⁻ + H ⁺ →	2
17		Identify 'A' and 'B' in the following sequence: (a) CH ₃ -CH ₂ -CH=CH ₂ $\xrightarrow{\text{HBr}}$ 'A' $\xrightarrow{\text{KOH(aq)}}$ 'B' (b) C ₆ H ₅ NH ₂ $\xrightarrow[0-5^\circ\text{C}]{\text{NaNO}_2 + \text{HBF}_4}$ 'A' $\xrightarrow{\text{Cu}}{\text{NaNO}_2}$ 'B'	2
18		Give mechanism of preparation of ethene from ethanol.	2
19		Silver is electrodeposited on a metallic vessel of surface area 800 cm ² by passing current of 0.2 ampere for 3 hours. Calculate the thickness of the silver deposited.	3
20	(a)	Why are carbonate and sulphide ore converted into oxides?	1
	(b)	How will you calculate temp. at which reduction takes place on the basis of thermodynamics if you are given ΔH and ΔS of the reaction?	1
	©	Why is NaOH used for leaching of bauxite ore?	1
21	(a)	A co-ordination compound has the formula Co Cl ₃ . 4NH ₃ . It does not liberate NH ₃ but forms a precipitate of AgCl on treatment with AgNO ₃ solution. Write the structure and IUPAC name of the complex.	2
	(b)	Name two properties of the central metal ion which enable it to form stable complex entities.	1
22		A first order reaction is 50 % complete in 36 minutes at 300 K. The same reaction is 50 %	3

		complete in 9 minutes at 350 K. Calculate the energy of activation of the reaction.	
23	(a)	What happens when NaOCl is treated with NH ₃ ? Give chemical equation involved.	1
	(b)	Complete the following: XeF ₄ + SbF ₅ →	1
	©	Draw the structure of peroxomonosulphuric acid.	1
24		Write short notes on the following: (a) Clemenson reduction (b) Carbyl amine reaction (c) Hofman bromamide degradation (d)	3
25	(a)	Name the deficiency disease cause due to vitamin 'E'	1
	(b)	Which force is responsible for the stability of β- pleated structure?	1
	©	Name the nucleoside which is present in DNA but not in RNA.	1
26	(a)	What is the difference between thermosetting and thermoplastic polymers? Give one example of each.	2
	(b)	Write the name and structure of the monomer of Nylon-6.	1
27	(a)	Write the structural difference between DNA and RNA.	1
	(b)	What are complementary bases? Give an example.	1
	©	Give an example of a zwitter ion.	1
		OR	
		What are detergents? Give their scheme of classification. Why are detergents preferred over soaps?	3
28	(a)	Why do transition metals form interstitial compounds?	1
	(b)	Name an amphoteric oxide of Cr.	1
	©	State the possible oxidation states of transition metals having configuration (i) 3d ⁵ 4s ² (ii) 3d ⁷ 4s ²	1
	(d)	Draw the structure of chromate ion.	1
	(e)	Co (II) gets oxidised to Co (III) in presence of complexing agents, why?	1
		OR	
	(a)	Complete the following: (i) Cr ₂ O ₇ ²⁻ + Sn ²⁺ + H ⁺ → (ii) MnO ₄ ⁻ + Fe ²⁺ + H ⁺ →	2
	(b)	Why are E ^o _{M²⁺/M highest in 3d transition series?}	1
	©	The outer electronic configuration of two members of lanthanoid series are as follows;	2

		$4f^1 5d^1 6s^2$ and $4f^7 5d^0 6s^2$ What are their atomic numbers? Predict the oxidation states exhibited by these elements in their compounds.	
29	(a)	45 g of ethylene glycol ($C_2H_6O_2$) is mixed with 600 g of water. Calculate the freezing point of the solution. $K_f = 1.86 \text{ K/m}$, Atomic mass of C = 12, H = 1, O = 16 u.	2
	(b)	What are non ideal solutions? Why do they deviate from Raoult's law?	1
	©	What will happen when red blood cells are placed in water?	1
	(e)	Which will have higher vapour pressure 1 M NaOH or 1 M glucose and why?	1
		OR	
	(a)	Two elements A and B form purely covalent compounds having molecular formula AB_2 and AB_4 . When dissolved in 20 g of benzene, 1 g of AB_2 lowers the freezing point by 2.3 K, whereas 1 g of AB_4 lowers it by 1.3 K. The molal depression constant for benzene is $5.1 \text{ K Kg mol}^{-1}$. Calculate the atomic mass of A and B.	3
	(b)	When 30 mL of ethanol is mixed with 30 mL of water, the volume of solution is more than 80 mL, why?	2
30	(a)	A compound 'A' with molecular formula $C_5H_{10}O$ gives a positive 2,4-DNP test but a negative Tollen's reagent test. 'A' is oxidised to 'B' with molecular formula ($C_3H_6O_2$) with hot alkaline $KMnO_4$. Sodium salt of 'B' gave a hydrocarbon 'C' on Kolbe's electrolytic method. Identify 'A', 'B' and 'C' and write the reactions involved.	3
	(b)	Distinguish between the following pairs with the help of suitable chemical test: (i) Formaldehyde and formic acid (ii) Ethanol and propan-1-ol	2
		OR	
	(a)	An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound 'B' which on heating with Br_2 and KOH forms a compound 'C' of molecular formula C_6H_7N . Write the structures and names of compounds A, B, C and give the reactions involved.	3
	(b)	Distinguish between the following pairs with the help of suitable chemical test: (i) Acetaldehyde and benzaldehyde (ii) Phenol and benzoic acid.	2