

Sample Paper – 2010
Class – XII
Subject – Chemistry

Time: 3 Hrs

Max Marks: 70

General Instructions:

- i. All questions are compulsory.
- ii. Questions 1 to 8 are very short answer type carrying 1 mark each. Answer them in one sentence each.
- iii. Questions 9 to 18 are short answer type carrying 2 marks each. Answer each of them in about 30 words.
- iv. Questions 19 to 27 are also short answer type carrying 3 marks each. Answer each of them in about 40 words.
- v. Questions 28, 29 & 30 are long answer type carrying 5 marks each. Answer each of them in about 70 words.
- vi. Calculators are not permitted. Use log tables if necessary.

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| 1 | What is the principle of refining metal by liquation? | 1 |
| 2 | Out of NO ₂ and N ₂ O ₄ , which is coloured and why? | 1 |
| 3 | Write IUPAC name of: C ₆ H ₅ NHCOCH ₃ | 1 |
| 4 | What is oxidoreductase? | 1 |
| 5 | Write IUPAC name of the ionization isomer of: [Cr (NH ₃) ₅ Br] SO ₄ | 1 |
| 6 | Write example of water in oil type colloid. | 1 |
| 7 | What are the different types of unit cells? | 1 |
| 8 | Complete:  | 1 |
| 9 | How is aluminium extracted from leached bauxite ore? | 2 |
| 10 | Find the charge required for:
(i) Oxidation of 1 mol water (ii) Reduction of 1mol Fe ₂ O ₃ into FeO | 2 |
| 11 | Explain the following:
(i) Clemenson reduction (ii) Diazotization | 2 |
| 12 | (i) Why are transition metal compounds coloured?
(ii) Although Sc is the first transition element, its compounds are colourless. Why? | 2 |
| 13 | Discuss the shape of BrF ₃ according to VSEPR method. | 2 |
| 14 | (i) Draw diagram to illustrate the depression of freezing point when non-volatile solute is dissolved in a volatile solvent.
(ii) How is this method used to calculate molecular mass of an unknown solute? | 2 |
| 15 | (i) Write mechanism for the cleavage of unsymmetrical ether having a tertiary group with HI.
(ii) Why ethyl ter-butyl ether cannot be prepared starting with ethanol? | 2 |
| 16 | How do you distinguish?
(i) Phenol & p-Cresol (ii) Propanol and ethanol | 2 |
| 17 | (i) What is spectrochemical series? | 2 |

(ii) Why are certain monodentate ligands called 'ambidentate'? Give example.

OR

Discuss the nature of bonding and magnetic property of the complex $[\text{Fe}(\text{CN})_6]^{3-}$ according to V.B theory. At. Number of Fe = 26

18 Give Reasons: 2

(a) Amines are weaker acids than alcohols.

(b) Phenol does not undergo acid catalyzed dehydration.

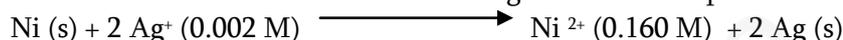
19 (a) What are the classes of neurologically active drugs? Write one example for each. 3

(b) What is the use of sodium benzoate in food?

20 (i) H_2S , a toxic gas with rotten egg like smell, is used for qualitative analysis. If the solubility of H_2S in water at STP is 0.195 m, Calculate Henry's Law constant. 3

(ii) What are Azeotropes? Write example.

21 (i) Calculate the emf of the cell in which the following reaction takes place. 3



Given that $E^\circ_{\text{Cell}} = 1.05 \text{ V}$

(ii) What are the products obtained at anode and cathode when aqueous NaCl is electrolyzed with electrodes?

22 Answer the following: 3

(i) How do you classify carbohydrates on the basis of hydrolysis?

(ii) What are nucleic acids? Mention their two important functions.

23 (i) Chromium crystallizes in bcc structure. Its atomic diameter is 245 pm, find density. Atomic masses of: Cr = 52u, $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$ 3

(ii) Atoms of element B form hcp lattice and those of A occupy 2/3 of tetrahedral voids. What is the formula of the compound b/w A and B?

24 Account for the following: 3

(i) Chlorobenzene is less reactive towards Nucleophilic substitution.

(ii) Ethyl amine has lower boiling point than ethyl alcohol.

(iii) pKa of ethanoic acid is greater than that of chloroethanoic acid.

25 (i) Write four differences b/w physisorption and chemisorption. 3

(ii) Why chemisorption is monolayered?

26 (a) What are chain growth and step growth polymerization? Give examples. 3

(b) Write preparation of: (i) Novolac (ii) Teflon

27 (i) Which metal in the 1st transition series exhibits +1 oxidation state most frequently and why? 3

(ii) Write down the number of 3d electrons in each of the following ions:

Ti^{2+} , V^{2+} , Cr^{3+} , Mn^{2+} , Fe^{2+} , Co^{3+} , Co^{2+} , Ni^{2+} and Cu^{2+}

Indicate how the five d orbitals to be occupied for these hydrated ions (Octahedral)

OR

(a) What are disproportionation reactions? Write two examples.

(b) Account for the following:

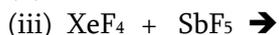
(i) Zr and Hf exhibit similar physical and chemical properties.

(ii) Transition elements exhibit highest oxidation states only in oxides and fluorides.

(iii) Actinoids exhibit more number of oxidation states than lanthanoids.

28 (a) Complete the following chemical equations and balance them. 5





(b) Explain the catenation property exhibited by Sulphur

(c) Why HBr is not prepared by reaction of a bromide salt with Conc Sulphuric acid?

OR

(a) Explain the Ostwald process for the manufacture of nitric acid. Draw shape of HNO_3 .

(b) Write balanced chemical equations for the reactions of conc. HNO_3 with:

(i) Iodine (ii) Copper

(c) What are Interhalogen compounds? ClF_3 is possible while FCl_3 is not possible. Why?

29 (i) A reaction is 1st order in A and second order in B 5

(a) Write differential rate equation.

(b) How is the rate affected when concentration of B is tripled?

(c) How is the rate affected when concentration of both A & B is doubled?

(ii) The rate of a reaction triples when temperature changes from $50^\circ C$ to $100^\circ C$. Calculate the activation energy of the reaction. $R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$.

OR

(a) The rate of reaction, $2NO + Cl_2 \longrightarrow 2NOCl$,

is doubled when concentration of Cl_2 is doubled and it becomes eight times when concentration of both NO and Cl_2 are doubled. Deduce the order of the reaction.

(b) At $380^\circ C$, the half life period for the first order decomposition of H_2O_2 is 360 min.. Calculate the time required for 75% decomposition at $380^\circ C$.

(c) Derive integrated rate equation for a zero order reaction.

30 (a) How do you convert the following? 5

(i) Aniline to N-methyl aniline

(ii) Benzaldehyde to α -hydroxy phenyl ethanoic acid

(iii) 2-bromopropane to 1-bromopropane

(b) Arrange the following in the increasing order of property indicated:

(a) CHF_2COOH , $CHCl_2COOH$, CH_3COOH ----- Acid strength

(b) CH_3NH_2 , $(CH_3)_2NH$, $(CH_3)_3N$, NH_3 ---- Basic strength in solution

OR

(i) An unknown aldehyde A, C_7H_6O on reaction with KOH gives B and C. A reacts with $Zn-Hg$ and conc HCl to give D which changes to A by CrO_2Cl_2 . B on heating with soda lime gives E. identify A to E and write all reactions.

(ii) Write equations for:

(a) Cross aldol condensation between propanal and ethanal in the presence of dil $NaOH$

(b) Disproportionation of Benzaldehyde in conc $NaOH$