JAIN COLLEGE

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Date: *SUBJECT: CHEMISTRY*

II PUC
Mock - I

Timings Allowed: 3 Hrs 15 Minutes   *Total Marks: 70*

Instructions:
1. The question paper has four parts: A, B, C and D. All parts are compulsory.
2. Write balanced chemical equations and draw labeled diagrams wherever required.
3. Use log tables and the simple calculator if necessary.
(Use of scientific calculators is not allowed)

PART-A

I. Answer ALL of the following. (Each question carries 1 mark)   10x1=10

1) State Henrys law.

2) Which type of ore is concentrated by froth floatation?

3) State faradays II law of electrolysis.

4) Give the composition of copper matte.

5) Name the vitamin responsible for coagulation of blood.

6) Define standard electrode potential.

7) Name the product formed when phenol is treated with conc HNO_3.

8) What is the value of Vant-Hoff factor 'I' for aqueous solution of strong electrolytes?

9) Name the method used to refine semiconducting metals.

10) What is an emulsion?

Part – B

II   Answer any FIVE of the following. (Each question carries 2 marks)   5 x 2 = 10

11) What is Schottky defect? How does it affect the density of solid?

12) Write anodic and cathodic reactions of fuel cell.

13) What is zero order reaction? Give an example.

14) Explain the catalytic properties of transition metals.

15) Explain Markovnikoff's addition with an example.

16) Differentiate between soaps and detergents.

17) What are biodegradable polymers? Give an example.

18) Explain Haloform reaction with an example.

PART C

III. Answer any FIVE of the following (each question carries 3 marks)   5 x 3 = 15

19) Describe Hall-Heroult process of isolation of aluminium.

20) Mention any three anomalous behavior of nitrogen.

21) Explain the geometry and magnetic property of $[NiCl_4]^{2-}$ using VBT. (Given atomic number of Ni=28)

22) a) How is phosphine prepared in laboratory?

b) Mention the allotropic form of sulphur. Which is more stable above 369 K?

23) Give the IUPAC name of $[CoCl_2(NH_3)_4]Cl$. Draw cis and trans isomer of $[CoCl_2(NH_3)_4]^+$ ion .

24) What is crystal field splitting? Write the energy level diagram for splitting in octahedral complex.

25) Fluorine exhibits -1 oxidation state .Why?

26) a) Draw Ellingham diagram for the formation of Feo from Fe,Co from C and CO_2 from CO.

b) Name the suitable reducing agent for the reduction of Fe_2O_3 below 1073 K and above 1073 K

PART D

IV. Answer any THREE of the following (each question carries 3 marks)   3 x 5 =15

27) a) Calculate the packing efficiency in hexagonal close packing structures.

b) Give an example of polar molecular solid.

28) a) Sodium metal crystallises in a BCC structure. Its unit cell edge length is 420 pm. Calculate its density (atomic mass of Na is 23u, $N_A = 6.022 \times 10^{23}$ mol^{-1})

b) What is Frenkel defect? How does it affect the density of a crystal?

29) State Raoult's law for a solution of 2 volatile liquids.

b) Write a note on reverse osmosis.

c) Mention an example of a maximum boiling azeotrope's.

30)a) 60% of a I order reaction was completed in 60 mins. When was it half completed?

b) Draw the energy distribution curve showing temperature dependence of the rate of the reaction.

31) Explain the mechanism of micelle formation.

b) Differentiate between lyophilic and lyophobic colloids.

V. Answer any FOUR of the following (each question carries 3 marks)   4 x 5 = 20

32)a) How are carboxylic acids prepared from Grignard reagent? Explain with an example.

b) How do you convert acetic acid to acetyl chloride?

33) a) Explain the mechanism of addition of HCN to aldehydes and ketones.

b) Complete the following reaction

i) RCOONa $\xrightarrow{\text{NaOH+CaO heat}}$ _____ $+Na_2CO_3$

ii)$CH_3CH_2COOH+Cl_2 \xrightarrow{\text{Red P}}$ _____ $+HCl$

34) a) Explain Williamsons ether synthesis.

b)Write the chemical equations for the following convertions

i) Ethanoic acid to acetamide

ii) Ethanoic acid to ethanoic anhydride

iii) Benzoic acid to m-dinitro benzoic acid

35) How is methanamine synthesized by Gabriel phthalamide synthesis? Give equations.

b) Explain Wrutz – Fittig reaction.

36) What are reducing sugars? Give an example.

b) Mention any two differences between starch and cellulose.

37)a) What are essential and non- essential amino acids? Give examples.

b) What is peptide bond? Write the structure of alanine.

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