Jain College, Jayanagar
II PUC Mock Paper - I
Subject: Chemistry (34)

Duration: 3 hrs 15 minutes **Max. Marks: 70**

General instructions:

a) All parts are compulsory.

b) Answer without relevant diagram, figure / circuit wherever necessary will not carry any marks.

c) Direct answers to the Numerical problems without detailed solutions will not carry any marks.

PART –A

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

1) Define the term 'molality'.
2) What is the hybridized state of carboxylic carbon atom?
3) Semiconductor elements are refined by ……
4) $CH_3-Br + AgF \rightarrow CH_3-F + AgBr$. Name the reaction.
5) What are homoleptic complexes?
6) Which is the strongest reducing agent among the hydrides of group 15 elements?
7) What is a secondary cell?
8) What will happen to the half life period of a first order reaction if the temperature is increased?
9) What type of magnetic behavior is shown by Sc^{3+} ion?
10) Name a vitamin, the deficiency of which gives rise to scurvy?

PART - B

II. Answer any FIVE questions in this part. Each question carries two marks **5 × 2 = 10**

11) Write the IUPAC names of each of the following
    (i) $K_3\{Fe(CN)_6]$ and (ii) $Na_3[Co(Ox)_3]$
12) Explain ionisation isomerism with an example.
13) How is methanoic aid converted into ethanoic acid?
14) Calculate the number of particles present in each unit cell of a FCC crystal lattice.
15) Give reasons for each of the following:
    (i) Benzaldehyde undergoes Cannizzaro reaction
    (ii) Acetophenone does not react with sodium bisulphite solution.
16) Write the Nernst equation and indicate the terms involved.
17) What are analgesics? Give an example
18) How is phenol converted into salicylic acid? Write the structural sequence.

PART –C

III. Answer any FIVE of the following. (Each question carries 3 mark) **5 × 3 = 15**

19) Write the postulates of Werner's theory of coordination compounds.
20) Describe the shape and structure of $[Co(NH_3)_6]^{3+}$ ion using the Valence bond theory. Predict its magnetic property.
21) Explain the reactions involved in the extraction of cast iron from haematite.
22) With the help of a flow chart outline the various steps which are involved in the manufacture of sulphuric acid by the contact process
23) How is potassium dichromate prepared from purified chromite ore
24) Name the metal of the 1st row transition series that
    (i) does not displace hydrogen from dilute acids
    (ii) forms colourless ions in its +2 oxidation state
    (iii) can exhibit +7 oxidation state

25) Complete the following equations:

(i) $3Cl_2 + 6NaOH$ (hot and conc.) → (ii) $XeF_6 + 3H_2O$ → (iii) $SO_2 + Cl_2$ →

26) Describe each of the following:

(i) Passivity of aluminium (ii) Brown ring test

PART –D

IV. Answer any THREE of the following. (Each question carries 5 mark) **3 × 5 = 15**

27) (a) Calculate the packing efficiency in a face centered cubic crystal lattice.

(b) Give an example of metal deficiency defect. **4 + 1**

28) (a) The molal elevation constant of water is 0.52^0/kg. If a solution of 3.75g of a non-volatile solute in 50g of water has a boiling point of 100.95^0C, what will be the molar mass of the solute?

(b) Describe any two applications of Henry's Law **3 + 2**

29) (a) With the help of a schematic diagram, describe the working of a hydrogen-oxygen fuel cell

(b) State Faraday's Laws of electrolysis. **3 + 2**

30) (a) Derive an integrated rate equation for the velocity constant of a first order reaction.

(b) A first order reaction takes 100 seconds to be 50% complete. Calculate the rate constant and the time required for the reaction to be 75% complete. **3 + 2**

31) (a) Write any three differences between lyophilic colloids and lyophobic colloids

(b) Mention any four characteristics of enzyme catalysis. **3 + 2**

V. Answer any FOUR of the following. (Each question carries 5 mark) **4 × 5 = 20**

32) (a) Mention the major product formed in the following reactions:

(i) A haloalkane is heated with an alcoholic solution of silver iodide

(ii) Acid chloride is treated with dialkyl cadmium

(iii) Isopropylbromide with alcohol potash

(b) How do aldehydes react with monohydric alcohols in the presence of dry HCl? **3+2**

33) (a) Write equations for each of the following:

(i) Swartzs reduction (ii) Stephen reduction (iii) Etard's reaction

(b) Complete the following equations:

(i) $ROH + SOCl_2$ → (ii) $RCHO + NH_2OH$ → **3+2**

34) (a) Describe Gabriel phthalimide synthesis.

(b) Give reasons for each of the following:

(i) Aniline does not undergo Friedel-Craft reaction

(ii) Aromatic amines cannot be prepared by the Gabriel phthalimide synthesis **3 + 2**

35) (a) Describe the synthesis of each of the following starting from benzene diazonium chloride

(i) benzene (ii) iodobenzene (iii) p-Hydroxyazobenzene

(b) How is benzamide converted into aniline? **3 + 2**

36) (a) What are nucleoside and nucleotide

(b) What are zwitterions? Write its general structure.

(c) Name an amino acid hormone. **2 + 2 + 1**

37) (a) What are thermosetting plastics? Name the monomers of Buna-N and write its partial structure.

(b) What is saponification? Write the equation. **3 + 2**

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