



Jain College, Jayanagar
II PUC Mock Paper - II
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) What is a binary solution?
- 2) Write the SI unit of molar conductivity.
- 3) Give an example of a first order reaction.
- 4) What is physical adsorption?
- 5) Give the composition of malachite
- 6) What is the structure of XeF₄?
- 7) What are enantiomers?
- 8) How many particles are present in each unit cell of a FCC crystal lattice?
- 9) Write the IUPAC name of the organic product formed when bromoethane is heated with ethanolic KCN.
- 10) What does the primary structure of a protein specify?

PART –B

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

- 11) What are F centers? Explain with an example.
- 12) Write the Nernst equation for the Daniel cell and indicate the terms involved.
- 13) The concentration of a reactant X decreases from 0.1M to 0.025M in 40 minutes. If the reaction follows I order kinetics, what will be the rate of the reaction when the concentration of X is 0.01M ?
- 14) Give reasons: (i) The majority of transition elements exhibit catalytic properties
(ii) Most of the d-block elements form coordination compounds
- 15) What is Hinsberg's reagent? How is it useful for distinguishing between primary, secondary and tertiary amines?
- 16) An alkyl halide is heated with sodium in dry ether. Name the reaction. Give the general equation.
- 17) What are "Histamines"? Give example.
- 18) What is copolymerization? Illustrate with an example.

PART –C

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

- 19) Explain the terms calcination and roasting with suitable examples
- 20) Dry chlorine (in a limited supply) is passed over heated white phosphorus to form a compound X. X is made to react with ethanol to form an organic compound Y. Y is heated with an alcoholic solution of KOH to form an organic compound Z. Identify X, Y and Z. Write equations for the reactions involved.
- 21) How is ozone layer useful? Explain two factors that pose threat to the ozone layer.
- 22) Complete the following equations:
 - (i) $F_2 + 2Cl^- \rightarrow$
 - (ii) $2Ca(OH)_2 + 2Cl_2 \rightarrow$
 - (iii) $NH_3 + 3Cl_2(\text{excess}) \rightarrow$

- 23) (i) Calculate the magnetic moment of Fe^{3+} ion
(ii) The electronic configuration of Cr is $3d^5 4s^1$ instead of $3d^4 4s^2$. Give reasons.
(iii) Name a transition metal that does not exhibit variable oxidation states
- 24) Write ionic equation for the reaction of permanganate with
(i) Oxalate ions in acidic medium (ii) Fe^{2+} ions in acidic medium
- 25) Using VBT account for the geometry and magnetic property of $[\text{NiCl}_4]^{2-}$.
[Given atomic number of Ni = 28].
- 26) Give the IUPAC name of $[\text{PtCl}_2(\text{en})_2]\text{Cl}_2$. Draw cis and trans isomers of $[\text{PtCl}_2(\text{en})_2]^{2+}$ ion and the dextro and laevo forms of the cis form.

PART –D

- IV. Answer any THREE of the following. (Each question carries 5 mark) 3 × 5 = 15**
- 27) What is a crystal lattice? Draw the unit cell of a face centered cubic lattice and calculate the packing efficiency in the BCC crystal lattice. 5
- 28) (a) The vapour pressure of pure A is 70 mm of Hg at 25°C . It forms an ideal solution with B in which the mole fraction of A is 0.8. If the total vapour pressure of the mixture is 84 mm of Hg at 25°C , what will be the vapour pressure of pure B at the same temperature?
(b) What happens to the solubility of a gas in a liquid with increase in pressure? Write the name and statement of the law on which your answer is based. 3 + 2
- 29) (a) Calculate the standard emf of the cell 298K at in which the cell reaction is;

$$\text{Cu}_{(s)} + 2\text{Ag}^+_{(aq)} \rightarrow \text{Cu}^{2+}_{(aq)} + 2\text{Ag}_{(s)}$$
Given the equilibrium constant of the reaction is 3.92×10^{15} .
(b) What is limiting molar conductivity? State Kohlrausch's law of independent migration of ions. Illustrate the law with a suitable example 3 + 2
- 30) (a) The velocity constant of a first order reaction was found to be $1.2 \times 10^{-4} \text{s}^{-1}$ and $2.4 \times 10^{-4} \text{s}^{-1}$ at 300K and at 310K respectively. Calculate the activation energy given $R = 8.314 \text{JK}^{-1} \text{mol}^{-1}$.
(b) Prove that the half-life period of a first order reaction is independent of the initial concentration of the reactants. 3 + 2
- 31) (a) What is peptisation? Describe the preparation of a positively charged AgI sol and a negatively charged AgI sol from AgNO_3 solution and KI solution.
(b) Explain the terms electrical double layer and zeta potential. 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) Propene is treated with diborane followed by oxidation using hydrogen peroxide in an alkaline medium.
(ii) Nitriles are hydrolysed in the presence of an acid
(iii) Sodium phenate is heated iodomethane.
(b) Write the structural representation of $\text{S}_{\text{N}}2$ mechanism using the hydrolysis of methyl bromide as an example. 3 + 2
- 33) (a) Write equations for each of the following:
(i) Reimer Tiemann reaction (ii) Fittig reaction
(b) Oxidation of a compound P gives a product Q which reacts with phenyl hydrazine but does not answer the silver mirror test. Name the compounds P and Q. 3 + 2
- 34) (a) Write equations for each of the following:
(i) Rosenmund reduction for the preparation of benzaldehyde
(ii) Aldol condensation taking ethanal as an example
(iii) Decarboxylation
(b) Give reasons:
(i) Aryl halides are extremely less reactive towards nucleophilic substitution.
(ii) An electron withdrawing group increases the acid strength of phenol. 3 + 2

- 35) (a) A ketone is treated with hydrazine to form a compound X. X is boiled with KOH in ethylene glycol to form Y. What are X and Y? Name the reduction.
(b) Arrange the following in the increasing order of their acidic strength in aqueous medium: Acetic acid, monochloroacetic acid and propanoic acid. Give one reason for the trend observed. **3 + 2**
- 36) (a) Mention two differences in the structures of amylose and amylopectin. Write the Haworth's structure of the monomer of starch.
(b) Give an example for each of the following:
(i) a sulphur containing α -amino acid (ii) a globular protein **3 + 2**
- 37) (a) Explain with an example, the formation of
(i) an addition polymer
(ii) a condensation polymer.
(b) (i) Name the monomers of Buna -S
(ii) Give an example of a thermoplastic **3 + 2**

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