



JAIN COLLEGE, Bangalore
Mock Paper - 1 January - 2019
II PUC – Chemistry (34)

Time: 3 Hours 15 Minutes

Max. Marks: 70

- INSTRUCTIONS :**
1. The question paper has four parts. All parts are compulsory.
 2. Part-A carries 10 marks. Each question carries one mark. Part-B carries 10 marks. Each question carries two marks. Part-C carries 15 marks. Each question carries three marks. Part-D carries 35 marks. Each question carries five marks.
 3. Write balanced chemical equations and draw diagrams whenever necessary.
 4. Use log tables and simple calculator if necessary. (Use of scientific calculator is not allowed)

PART-A

- I. Answer ALL of the following. (Each question carries 1 mark) 10 × 1 = 10**
1. Two liquids A and B on mixing produce cold solution. Which type of deviation from Raoult's law does it show?
 2. Sodium chloride is used to clear snow from the roads. Why?
 3. Define limiting molar conductivity.
 4. Express the rate of the following reaction in terms of disappearance of hydrogen in the reaction $3\text{H}_2(\text{g}) + \text{N}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
 5. What is Brownian movement?
 6. Which type of ore is concentrated by froth floatation process.
 7. How does Bartlett compound prepared?
 8. $\text{CH}_3\text{-Br} + \text{AgF} \rightarrow \text{CH}_3\text{-F} + \text{AgBr}$ Name the reaction.
 9. Write one use of formalin.
 10. Name the amino acid which is optically inactive.

PART-B

- II. Answer any FIVE of the following. (Each question carries 2 marks) 5 × 2 = 20**
11. What is meant by coordination number in solids? What is the coordination number in a face centred cubic close packing structure?
 12. Calculate the mass of aluminium deposited when 193C of current is passed through molten electrolyte containing dissolved alumina. Given, molar mass of Al = 27 gmol⁻¹ and 1F = 96500Cmol⁻¹
 13. Name the factors affecting rate of a reaction.
 14. Give reasons: (a) Mn exhibits maximum oxidation state of +7 among 3d series of transition elements (b) Most transition elements have high melting and boiling point.
 15. What is the action of phenol with fuming nitric acid? Give equation.
 16. How does Fehling's solution react with aldehydes? Give equation.
 17. What are antiseptics and disinfectants? Give one example of a substance that can act both as an antiseptic as well as a disinfectant.
 18. What are antioxidants? Give example.

PART-C

- III. Answer any FIVE of the following. (Each question carries 3 marks) 5 × 3 = 15**
19. How is gold extracted by cyanide process? Give equations.
 20. (a) How is phosphine prepared in the laboratory?
(b) The stability of +5 oxidation state decreases down the 15th group. Why? c) Which allotropic form of phosphorus exhibits chemiluminescence?

21. Write the equations for
- Action of con. H_2SO_4 on sucrose(carbohydrate)
 - Action of ozone with lead sulphide
 - Action of dioxygen with methane
22. Complete the equations:
- $\text{Cl}_2 + \text{SO}_2 + 2\text{H}_2\text{O} \longrightarrow$
 - $\text{I}_2 + 3\text{Cl}_2(\text{excess}) \longrightarrow$
 - $8\text{NH}_3(\text{excess}) + 3\text{Cl}_2 \longrightarrow$
23. (a) What is the gas liberated when
- Crystals of KMnO_4 is heated to 573K
 - Acidic KMnO_4 is treated with oxalate ion at 333K
- (b) Complete the following equation: (2+1)
- $$2\text{MnO}_4^- + 3\text{Mn}^{2+} + 2\text{H}_2\text{O} \longrightarrow$$
24. (a) Compare any two properties of Lanthanoids and actinoids. (2+1)
- (b) Write the general electronic configuration of f-block elements.
25. Using VBT, explain geometry and magnetic property of $[\text{NiCl}_4]^{2-}$. (Atomic No. of Ni=28)
26. (a) Mention any one important use of coordination compounds in the field of Biology and Metallurgy. (2+1)
- (b) What is crystal field splitting?

PART-D

IV. Answer any THREE of the following. (Each question carries 5 marks)

3 × 5 = 15

27. (a) Give any two differences between Schottky and Frenkel defect in ionic solids.
- (b) Calculate the number of atoms per unit cell of FCC.
- (c) Define unit cell. (2+2+1)
28. (a) The vapour pressure of pure benzene at certain temperature is 0.850bar. A non-volatile, non-electrolyte solid weighing 0.5 g is to 39.0 g of benzene(molar mass 78gmol^{-1}). The vapour pressure of the solution is then 0.845bar. What is the molar mass of the substance?
- (b) Give reason: (i) NaCl dissolves in water, but not in benzene
- (ii) Raisin swell in size when kept in water. (3+2)
29. (a) Calculate the equilibrium constant for the reaction at 298K
- $$\text{Cu}_{(s)} + 2\text{Ag}^+_{(aq)} \longrightarrow \text{Cu}^{2+}_{(aq)} + 2\text{Ag}_{(s)} ; E^\circ_{\text{cell}} = 0.46\text{V}$$
- (b) Write symbolic representation of standard hydrogen electrode and give its standard potential value. (3+2)
30. (a) Show that $t_{99\%} = 2t_{90\%}$ for a first order reaction. (3+2)
- (b) Explain the effect of a catalyst on the rate of a reaction.
31. (a) Explain the preparation of gold sol by Bredigs' arc method.
- (b) What is homogeneous catalysis? Give one example. (2+2+1)
- (c) What happens to entropy when the gas is adsorbed on solid.

V. Answer any FOUR of the following. (Each question carries 5 marks)

4 × 5 = 20

32. (a) Explain SN^2 mechanism with an example.
- (b) Define (i) Optical activity
- (ii) Enantiomers
- (c) Mention the reagent used in β -elimination reaction (2+2+1)
33. (a) Why the boiling points of ethers are lower than those of alcohols of comparable molecular mass?
- (b) How will you convert anisole to phenol? (2+2+1)
- (c) Among alcohols and phenols which one is more acidic and why?

34. (a) Name the reagent used in the
(i) decarboxylation of carboxylic acid
(ii) Conversion of ethanal into but-2-enal
(iii) Conversion of ketones to oximes
(b) Explain Gatterman-Koch reaction with equation. (3+2)
35. (a) Methyl amine is more basic than ammonia. Give reason
(b) What is Hinsberg reagent? How does it help in differentiating 1^o, 2^o and 3^o amines?
(c) Give the IUPAC name of diethyl methyl amine. (2+2+1)
36. (a) How does glucose react with bromine water? What does it indicate about the structure of glucose?
(b) What are essential amino acids? Give example.
(c) Deficiency of which vitamin causes Xerophthalmia. (2+2+1)
37. (a) Write the partial structures of
(i) Buna – S (ii) Terylene (iii) Nylon – 6
(b) What is vulcanisation of rubber? Why is it done? (3+2)



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Mock Paper - 2 January- 2019
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Time: 3 Hours 15 Minutes

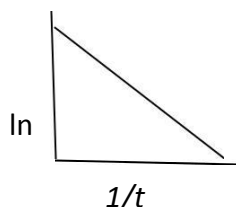
Max. Marks: 70

PART A

- I. Answer all of the following (each question carries 1 mark) 10 × 1 = 10
1. Define isotonic solutions.
 2. Freezing point of sea water is less than 0°. Why?
 3. Write the equation for the reaction occurring at anode in the lead acid battery when it is in use.
 4. If half-life of a reaction is independent of initial concentration of the reactants, what is the order of the reaction?
 5. What is emulsion?
 6. Give the composition of copper matte.
 7. Noble gases have very low boiling point. Why?
 8. What are Freons?
 9. What type of aldehydes undergo cannizzaro's reaction?
 10. Deficiency of which vitamin causes pernicious anaemia?

PART –B

- II. Answer any five of the following (each question carries 2 mark) 5 × 2 = 10
11. Mention any two-crystal systems in which all edge length of unit cell is same.
 12. What are the products formed at anode and cathode when aqueous solution of sodium chloride is electrolysed?
 13. From the graph given below, what does slope and intercept indicate?



14. What is the formula of the compound when Lanthanoid (Ln) reacts with (i) Halogen (ii) Nitrogen
15. What is the action of phenol with dil. HNO₃? Give equation.
16. What is Tollen's reagent? Give equation for the reduction action of Tollen's reagent on aldehydes.
17. Give one example each for (i) Antifertility drug (ii) Cationic detergent
18. (a) What is drug target?
(b) Why detergents are preferred over soaps?

PART –C

- III. Answer any five of the following. (Each question carries 3 marks) 5 × 3 = 15
19. (a) How is zinc extracted from zinc oxide?
(b) Name the depressant used in the separation of sulphide ores containing ZnS and PbS. (2+1)
 20. Give reason: (a) PH₃ has lower boiling point than NH₃.
(b) R₃P=O exist, but R₃N=O does not.
(c) PCl₃ fumes in moisture.
 21. (a) Give an example in which oxygen shows -1 oxidation state.
(b) Mention the allotropic form of sulphur which is stable above 369K .

- (c) Write the structure of sulphuric acid.
22. (a) Explain the action of chlorine on slaked lime. Give the equations.
 (b) Fluorine can exhibit -1 oxidation state, but other halogens can exhibit higher oxidation states. Why? (2+1)
23. Write ionic equations for the reaction of dichromate ion with
 (a) Hydroxyl ions (b) Fe^{2+} ions
 (c) In which one of the above two reactions, oxidation state of chromium remains the same.
24. (a) Transition metals and their compounds are used as catalysts. Give reason. (2+1)
 (b) Write the outer electronic configuration of Cr (at. no. of Cr=24)
25. (a) Explain Linkage isomerism with an example.
 (c) Give an example for neutral bidentate ligand. (2+1)
26. For $[\text{Co}(\text{en})_3]\text{Cl}_3$
 (i) Give the IUPAC name
 (ii) Give the coordination number of the central metal ion
 (iii) Give the type of stereoisomerism it exhibits

PART –D₁

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

27. (a) Silver crystallizes in FCC lattice. If the edge length of cell is 4.077×10^{-8} cm, calculate the density of silver. Given atomic mass of Ag = 108amu and $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$. (2+2+1)
 (b) Mention the most ordered and disordered crystal system.
 (c) What type of semiconductor is formed when 13th group element is doped with silicon.
28. (a) 100 ml of a solution containing 3g of a solute shows osmotic pressure of 2.051 atm at 300K. Calculate the molecular mass of solute.
 (b) State Raoult's law for solutions containing two volatile liquids. Write the mathematical expression. (3+2)
29. (a) The molar conductances of sodium chloride, hydrogen chloride and sodium acetate at infinite dilutions are 126.45, 426.16 and 91.0 $\text{ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$ at 25°C respectively. Calculate the molar conductivity of acetic acid at infinite dilution.
 (b) What is specific conductivity? Mention its unit. (3+2)
30. (a) Derive the expression for integrated rate equation for a first order reaction.
 (b) Mention two criteria for the effective collision according to Collision Theory. (3+2)
31. (a) What is (i) Multi molecular colloid
 (ii) Macro molecular colloid (iii) Associated colloid
 (b) Give any two characteristic features of enzyme catalyst. (3+2)

PART D₂

V. Answer any four of the following questions (each question carries 5 marks) 4 × 5 = 20

32. (a) Identify the products A, B and C in the following equation.

$$\text{CH}_3\text{--CH}_2\text{--CH}_2\text{--OH} \xrightarrow[\text{Anhyd. ZnCl}_2]{\text{HCl}} \text{A} \xrightarrow{\text{Alc. KOH}} \text{B} \xrightarrow{\text{HBr}} \text{C}$$

 (b) Write the equation for the steps in SN^1 mechanism for the conversion of tert-butyl bromide into tert-butyl alcohol. (3+2)
33. (a) Write the mechanism of acid catalysed dehydration of ethanol to ethene. (3+2)
 (b) Explain the manufacture of methanol commercially. Give equation.
34. (a) What is the action of dil. NaOH on acetaldehyde? Name the reaction.
 (b) What is the action of ethyl alcohol on acetaldehyde? Name the product formed and give equation. (3+2)
35. (a) How do you obtain p-nitro aniline (mono substituted product) from aniline?

- (b) What are coupling reactions? Give an example. (3+2)
36. (a) Write the Haworth structure of maltose.
(b) How is a dipeptide formed? Give equation. (2+2+1)
(c) Name the nitrogenous base present only in DNA but not in RNA.
37. (a) Name the type of attractive forces present in
(i) Elastomers (ii) Fibrous polymers
(b) Mention one important use of the following polymers.
(i) Orlon (ii) Melamine-formaldehyde resin
(c) Give the IUPAC name of the monomer of natural rubber. (2+2+1)
