

**II CHEMISTRY (34) MODEL
QUESTION PAPER - 1**

Time: 3 hours 15 minutes

Maximum Marks: 70

Instructions:

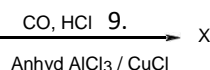
1. The question paper has four parts: A, B, C and D. All parts are compulsory.
2. Write balanced chemical equations and draw labelled diagrams wherever required.
3. Use log tables and the simple calculators if necessary.

(Use of Scientific Calculators is not allowed)

PART- A

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

1. State Henry's law.
2. What is the conclusion drawn when Vant Hoff's factor of a solution is less than one?
 3. How molar conductivity varies with dilution?
4. Mention one criterion for intermolecular collisions of two reactants to be effective.
 5. Name the metal that is refined by Van Arkel method.
 6. Name the first noble gas compound prepared by Neil Bartlett?
 7. Give an example for Heteroleptic complex.
 8. Write the IUPAC name for $\text{CH}_3\text{-CH}(\text{CH}_3)\text{-CH}_2\text{Cl}$.



Give the name of the product X.

10. Name the storage polysaccharide present in animals.

PART- B

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

11. a) Give one example for paramagnetic substance.
b) Which type of binding force existing in ice?
12. Write anodic and cathodic half-cell reactions taking place in Daniel cell.
13. Show that for first order reaction $t_{87.5\%} = 3 t_{50\%}$.
14. What is lanthanide contraction? What is the cause for it?
15. How do you convert bromoethane into tertiary-butylethyl ether? Give the chemical equation of the reaction.
 16. What is Stephen's reaction? Give the chemical equation of the reaction.
 17. What is the therapeutic action of a) Paracetamol b) Barbituric acid.
 18. What are anionic detergents? Give an example.

PART- C

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

19. Explain the extraction of aluminium from purified alumina by Hall-Heroult process.

3

20. Explain manufacture of nitric acid by Ostwald's process.

3

21. a) How is ozonised oxygen prepared? 2
b) Write the structure of sulphurous acid. 1
22. a) How does phosphorus react with limited amount of chlorine? Give equation. 2
b) What is the product obtained by the reaction between fluorine in excess of bromine? 1
23. a) 3d Transition metals and their compounds are good catalysts. Give two reasons? 2
b) Give the formula for the calculation of spin only magnetic moment. 1
24. Explain the manufacture of Potassium dichromate from chromite ore. 3
25. Using VBT explain, 3
i) Geometry of the complex
ii) Type of hybridization, in the complex ion $[\text{CoF}_6]^{3-}$.
iii) Is it an inner or outer orbital complex?
26. a) Draw the structures of cis -trans isomers for $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$. 2
b) How many ions are produced from the aqueous solution of complex $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3]$ 1

PART –D

IV. Answer Any THREE of the following. (Each questions carries 5 mark) $3 \times 5 = 15$

27. a) Calculate the packing efficiency in a Face Centered Cubic lattice. 3
b) If a metal with atomic mass 209 crystallizes in a simple cubic lattice what is the edge length of its unit cell. (Given $d = 91.5 \text{ kg m}^{-3}$). 2
28. a) 5.8g of a non-volatile solute was dissolved in 100g of carbon disulphide (Molar mass = 76). The vapour pressure of the solution was found to be 190mmHg. Calculate the molecular mass of the solute. The vapour pressure of pure carbon disulphide 195 mm Hg. 3
b) What are azeotropes? Give an example. 2
29. a) The resistance of M/10 solution is found to be 2.5×10^3 ohms. Calculate molar conductance (Given Cell constant = 1.15 cm^{-1}). 3
b) Mention two general methods for prevention of corrosion. 2
30. a) Derive an expression for rate constant of a first order reaction. 4
b) What is the effect of positive catalyst on energy of activation? 1
31. a) Mention two factors which affect adsorption of a gas on a solid. 2
b) Is synthesis of ammonia by Haber's process, a homogeneous or heterogeneous catalysis? 1
- c) State Hardy-Schulze rule. Among $\text{Al}_2(\text{SO}_4)_3$ and $(\text{NH}_4)_3\text{PO}_4$ which is better coagulating agent for a negative sol ? 2

V. Answer ANY FOUR of the following. (Each questions carries 5 mark) $4 \times 5 = 20$

32. a) Complete the following reaction and write its name
 $2C_6H_5Cl + 2Na \xrightarrow{\text{Dry ether}} ? + 2NaCl$ 2
- b) Explain Zaitsev rule with an example. 2
- c) A Haloalkane when boiled with aqueous KOH which gives an alcohol having inversed configuration. Name the mechanism involved in this reaction. 1
33. a) Explain the mechanism involved in the conversion of ethanol into ethene. 3
- b) An organic compound with molecular formula C_6H_6O gives white precipitate with bromine water. Identify the functional group in the organic compound and write the chemical equation for the reaction.
34. a) Explain Cannizaro's reaction with an example. 2
- b) Name the product obtained by the reaction of acetyl chloride with dimethylcadmium. 1
- c) Explain the reaction between carboxylic acid and PCl_5 . 2
35. a) Explain carbylamine reaction by taking methyl amine as an example. 2
- b) Why do primary amine have higher boiling point than tertiary amines? 1
- c) Give an example for a coupling reaction of diazonium salt and give its chemical equation. 2
36. a) Deficiency of which vitamin leads to night blindness? 1
- b) Which hormone is responsible for the hyperthyroidism? 1
- c) What is a Zwitter ion of an amino acid? Give its general formula. 2
- d) What is a nucleotide? 1
37. a) What are Elastomers? Give example. 2
- b) Write the partial structure of nylon 6, 6 and Bakelite. 2
- c) What is vulcanization of rubber? 1
- d) What is a nucleotide? 1
37. a) What are Elastomers? Give example. 2
- b) Write the partial structure of nylon 6, 6 and Bakelite. 2
- c) What is vulcanization of rubber? 1

CHEMISTRY

Time: 3 hr-15 min.

Batch-02

Max Marks: 70

Instructions:

JJ The question paper has four parts, A, B, C and D. All parts are compulsory

KK Part-A Carries 10 marks

2 Write balanced equations and draw diagrams wherever required

(Use log tables and the simple commercial calculator if necessary (use of scientific calculator is not allowed))

Part-A

I. Answer all questions,

10 X 1=10

3. Define the term molality.
4. How does the enthalpy change during the formation of a non-ideal solution two liquids showing positive deviation from Raoult's law?
5. What is a primary electrochemical cell?
6. For the reaction $2\text{NH}_3(\text{g}) \xrightarrow[1130\text{K/Mo}]{\text{N}_2(\text{g})} \text{N}_2(\text{g}) + 3\text{H}_2(\text{g})$ what is the order?
7. What do you mean by selectivity of a catalyst?
8. Give the chemical composition of Copper matte.
9. Name the noble gas that is radioactive?
10. Write the general equation of the preparation of alkyl chlorides from alcohols using SOCl_2 .
11. What are acetals?
12. Name the water insoluble component of the starch?

Part-B

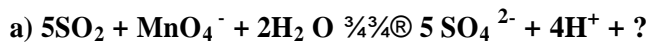
II. Answer any five of the following each questions carries two marks 5 X 2=10

2. An element having atomic mass 60 amu. has FCC unit cell. The edge length of the unit cell is 4×10^2 pm. Find the density of the unit cell.
3. Write two applications of Kohlrausch law.
4. The half-life period of a certain reaction is directly proportional to initial concentration of the reactant. predict the order of the reaction and write the expression to calculate the half-life period of the reaction.
5. Give two consequences of lanthanoids contraction.
6. Complete the following reaction;
i) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow[\text{Cu/300}^\circ\text{C}]{\text{O}}$?
- ii) $\text{R}-\text{COOH} \xrightarrow{\text{RCH}_2\text{OH}}$. Name the reagent used in the conversion?
16. How does ketone react with ethylene glycol. Write chemical equation for the reaction.
17. What are analgesics? Give an example for non-narcotic analgesics.
18. What are artificial sweeteners? Give an example.

Part-B

III. Answer any five of the following each questions carries three marks 5 X 3=15

3. On the basis of Ellingham's diagram explain the principle of extraction of iron from its oxide ore.
4. Explain the principles involved in the manufacture of ammonia by Haber's process.
5. Complete the following equations;



1+1+1

- MnO₂
22. a) Explain the action of Conc. HCl on KMnO₄ crystals 2
 - b) Write the structure of perchloric acid. 1
 23. a) Transition metals show variable oxidation states. Explain 2
 - b) Which metal of 3d-series exhibit maximum number of oxidation state? 1
 24. How is K₂Cr₂O₇ manufactured from chromite ore. 3
 5. Using valence bond theory (VBT), account for the geometry, type of hybridization and magnetic property of [NiCl₄]²⁻ 3
 26. Define linkage isomerism of co-ordination compounds. Give an example 3

Part-D

IV. Answer any three of the following, each question carries five marks

5 X 3=15

27. a) Calculate the packing efficiency in BCC lattice 3
- b) Calculate the number of particles per unit cell in FCC 2
2. a) Acetone boils at 56.38°C and a solution of 1.41g of an organic compound in 20 g of acetone boils at 56.88°C. Calculate the molar mass of the organic compound (Given K_b for acetone =1.67 K kg/mol). 3
- b) what is reverse Osmosis, mention one important application of it. 2
29. a) Standard EMF of the cell; $\text{Cu} | \text{Cu}^{2+} (1\text{M}) || \text{Ag}^+ (1\text{M}) | \text{Ag}$ is 0.46 V at 25 °C. Find the value of standard free energy change for the reaction that occurs in the cell. 3
- b) Draw the neat labeled diagram of SHE and write its symbolic representation. 2
30. a) Derive the integrated rate equation for a zero order reaction 3
- b) Give any two differences between order and molecularity of reaction 2
31. a) Write any two differences between lyophilic sols and lyophobic sols 2
- b) What are the differences between physisorption and chemisorption 2
- c) Give an example for homogeneous catalysis 1

V. Answer any four of the following, each question carries five marks 4 X 5=20

2. a) i) Name the organic product formed when chloroalkane is heated with concentrated solution of sodium iodide (NaI) in acetone?
- b) Write the chemical equation for the above reaction
- iii) Name the above reaction (1+1+1)
- b) Explain Fittig's reaction with an equation 2
16. a) Organic compounds A, B and C are aliphatic saturated hydroxyl compounds when they react with Lucas reagent (anhyd.ZnCl₂ + conc. HCl), the following observations are made
- i) Compound A gave turbidity immediately (1+1+1)
- 2 Compound B gave turbidity after five minutes
- 3 Compound C gave turbidity only on heating, Identify the type of compounds A, B and C.

H⁺

- b) Complete the equation: $C_6H_5COOH + HOC_6H_5 \xrightarrow{H^+}$? **1**
- c) Name the main organic product formed when anisole is reacted with HI **1**
34. a) Which of the following organic compound undergoes Cannizzaro's reaction? **1**
i) CH₃CHO ii) HCHO
- b) Write the mechanism of addition of HCN to a carbonyl compounds **2**
20. Explain the conversion of carboxylic acid into an acid amide. Give the general chemical equation **2**
35. a) Explain Mendius reduction with an equation. **2**
b) When aniline is treated with HNO₂ at 273-278 K, benzene diazonium chloride is formed. Write the equation and name the reaction. **2**
c) What is Hinsberg's reagent?
36. a) Write the Haworth's structure of sucrose **2**
b) What are non-essential amino acids? **1**
c) Name the heterocyclic N-containing base present only in DNA but not in RNA. **1**
d) Vitamin-C cannot be stored in the body. Give reason. **1**
37. a) Which among the following is a homopolymer and a co-polymer, **2**
i) Nylon-6,6 ii) PVC
b) How is Buna-N prepared ?. Write the equation **2**
c) Give one example for a non-biodegradable polymer

Model paper – 3
II PUC – CHEMISTRY (34)

Time: 3 hours 15 minutes

Maximum marks: 70

Instructions:

LL The question paper has four parts: A, B, C and D. All parts are compulsory.

MM Write balanced chemical equations and draw labeled diagrams wherever required.

NN Use log tables and the simple calculator if necessary.

(Use of scientific calculators is not allowed)

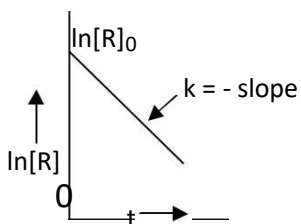
PART-A

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

10x1=10

(Answer each question in one word or in one sentence)

- 3 What is the effect of increase in temperature on the solubility of gas in a liquid?
- 4 Define osmotic pressure .
- 5 Mention the concentration of H^+ ions in the solution used in SHE .
- 6 From the following plot, predict the order of the reaction.



5. $2SO_2(g) + O_2(g) \xrightarrow{NO(g)} 2SO_3(g)$. Is this reaction an example for Homogenous or Heterogeneous catalysis.

13. Name the depressant used in separation of ZnS from PbS by froth floatation process.

14. Which noble gas does not occur in nature?

8. $R-X + NaI \xrightarrow{\text{Dry Acetone}} R-I + NaX$. This reaction is known as -----

7 Give reason: Acetic acid is soluble in water.

8 Among the following which is a fat soluble vitamin Vitamin-B₁₂, Vitamin-C, Vitamin-D.

PART-B

II. Answer any FIVE of the following. (Each question carries 2 marks)

5x2=10

6. Give two differences between p-type & n-type semiconductors.
7. What is limiting molar conductivity? Represent graphically the variation in molar conductivity with concentration for acetic acid.

6. Rate constant of a first order reaction is $6.93 \times 10^{-3} \text{ min}^{-1}$. Calculate the half-life period.
7. i) What is actinide contraction?
Which is the common oxidation state exhibited by actinides?
6. How do you prepare diethyl ether by dehydration of ethanol?
- 3 How do you convert benzamide to benzoic acid?
- 4 Give one example each for i) Tranquilizer ii) Antiseptic.
- 5 What is saponification with an example.

PART-C

III. Answer any FIVE of the following. (Each question carries 3 marks) 5x3=15

19. How copper is refined by electrolytic method. 3
20. i) Write the structure & mention basicity of hypo phosphorous acid. 2
ii) Which gas is liberated when zinc reacts with dil HNO_3 ? 1
21. Draw the flow chart for the manufacture of sulphuric acid by Contact process.
Name the catalyst used in the process 3
22. i) Give any two reasons for the anomalous behaviour of fluorine 2
ii) Give one example of interhalogen compounds 1
23. What are interstitial compounds? 1
Write any two characteristics of interstitial compounds 2
24. i) Write the two chemical equations to show the inter conversion of chromates & dichromates in aqueous solution 2
ii) Complete the equation : $5\text{C}_2\text{O}_4^{2-} + 2\text{MnO}_4^- + 16\text{H}^+ \longrightarrow$ 1
25. With the help of valence bond theory account for the geometry & magnetic property of $[\text{Co}(\text{NH}_3)_6]^{3+}$ 3
26. i) What is an ambidentate ligand? 1
Name the type of structural isomerism that arises in the co-ordination compound containing such a ligand 1
ii) Give the IUPAC name of $\text{K}_2[\text{Zn}(\text{OH})_4]$ 1

PART-D

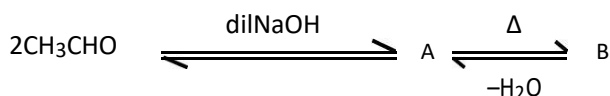
IV. Answer any FIVE of the following. (Each question carries 3 marks) 3x5=15

27. a) Calculate the packing efficiency in a CCP crystal lattice 4
b) What is the number of particles per unit cell of a simple cube. 1
28. a) Calculate the osmotic pressure of 0.05% urea solution in water at 20°C .
Given $R = 0.0821 \text{ Latm mol}^{-1}\text{K}^{-1}$. Molar mass of urea = 60 g mol^{-1} 3
b) Give two general characteristics of an ideal solution of two liquids 2
29. a) Calculate the emf of the cell in which the following reaction takes place
 $\text{Ni}(\text{S}) + 2\text{Ag}^+(0.002\text{M}) \rightleftharpoons \text{Ni}^{2+}(0.160\text{M}) + 2\text{Ag}(\text{S})$, Given that $E^\circ_{\text{Cell}} = 1.05\text{V}$ 3
b) A galvanic cell after
What type of cell is it? Give an example 2
30. a) Rate constant of a reaction at 300K & 400K are 0.034S^{-1} & 0.136S^{-1} respectively.
Calculate the activation energy for the reaction [Given: $R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$] 3

- b) Derive the expression for half-life of zero order reaction 2
31. a) Mention two applications of adsorption 2
- b) What are emulsions? Give an example for O/W emulsion 2
- c) What is the cause for Brownian movement? 1

V. Answer any FIVE of the following. (Each question carries 3 marks) 4x5=20

32. a) Explain S_N^2 mechanism with an example 2
- b) Name the product formed when chloromethane reacts with (i)aqueous KOH & (ii)alcoholicAgCN 2
- c) Give an example of polyhalogen compound 1
33. a) Explain esterification reaction between acetic acid & ethyl alcohol as example 2
- b) Boiling point of alcohol is greater than the boiling point of hydrocarbons of comparable molar masses, Why? 1
- c) What is the effect of $-NO_2$ group on the acidic strength of phenol? Give reason 2
34. a) Explain Etard reaction 2
- b) Name the products A & B in the following reaction 2



- c) Name the reagent used in the decarboxylation of carboxylic acid 1
35. a) How do you convert benzene diazonium chloride into chlorobenzene. Name the reaction 3
- b) Explain Hoffmann Bromamide reaction with an example 2
36. a) Write the Haworth structure of maltose 2
- b) What are hormones? Give one biological function of insulin 2
- c) What are nucleosides? 1
37. a) Name the monomers of Nylon-6,6 2
- b) How is Neoprene prepared? Give equation 2
- c) Give an example for thermoplastic polymer. 1

CHEMISTRY (34) NEW SCHEME

MODEL QUESTION PAPER NO.4

TIME 3HOURS 15 MINUTES

MAX.MARKS.70

Instructions :

i. The question paper has four parts. All the four parts are compulsory

OO PART –A carries 10 marks , each question carries one marks. PART-B carries 10 marks . each question carries two marks

PARRT –C carries 15 marks . each question carries three marks

PART-D carries 35 marks . each question carries five marks

7 write balanced chemical equations and draw diagrams wherever necessary

8 use log table and simple calculators if necessary

(use of scientific calculator is not allowed)

PART-A

3. ANSWER ALL THE QUESTIONS. EACH QUESTION CARRIES ONE MARK 1X10=10

- 9 Define VantHaff's factor.
- 10 What are isotonic solutions ?
- 11 Mention the S.I unit for molar conductivity.
- 12 For the reaction $A+B \rightarrow \text{products}$.the rate becomes doubled when concentra on of only A is increased by two times, the rate is increased by four times, when the concentration of B alone is doubled what is the order of the reaction?
- 13 Name the enzyme used in the inversion of cane sugar
- 14 Name the method used for refining of Zirconium.
7. Complete the reaction $XeF_4 + O_2F_2 \rightarrow A + O_2$ Identify A
8. What is a Recemic mixture-?
9. Name the product obtained when acetaldehyde reacts with Hydroxyl amine.
10. Name the nitrogenous base present in RNA only.

PART-B

II ANSWER ANY FIVE OF THE FOLLOWING EACH QUESTION CARRIES TWO MARKS. 5X2=10 MARKS

8. Silver forms CCP lattice and x-ray studies of its crystals show that the edge length of its unit cell is 408.6 pm . calculate the density of silver (Atomic mass of Ag= 107.9u)
9. What is corrosion? Mention a general method to prevent it.
10. Write the Arrhenius equation and mention what each term stands for.
11. Any two differences between lanthanides and Actinides.

- 6 How does Acetyl chloride react with Anisol in presence of anhydrous aluminum chloride catalyst. Write the chemical equation of the reaction.
- 7 What are the effects of the electron withdrawing and electron donating groups on acidity of carboxylic acids
- 8 What are antacids? Give an example.
- 9 What are food preservatives ? Give one example

PART –C

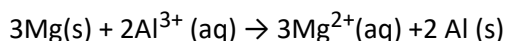
III ANSWER ANY FIVE OF THE FOLLOWING EACH QUESTION CARRIES THREE MARKS 5X3= 15

- 3 How is pure alumina obtained from Bauxite by leaching process?
- 4 Write the reactions that takes place during the manufacture of nitric acid by Ostwald's process.
- 5 i) what happens when potassium chlorate is heated in presence of MnO₂. write the equation for the reaction also
b) draw the structure of sulphuric acid.
- 6 i) How is chlorine prepared by using MnO₂ ?
b) complete the reaction
$$\text{NH}_3 + \text{Cl}_2 (\text{excess}) \rightarrow$$
- 7 d-block elements form co-ordination compounds . Give reasons.
- 8 How is potassium dichromate prepared from the chromite ore?
- 9 Mention the geometry, magnetic property and type of hybridization in [Ni(cn)₄]²⁻ complex.
- 10 Write any three postulates of Werner's theory of complexes.

PART-D

IV ANSWER ANY THREE OF THE FOLLOWING . EACH QUESTION CARRIES FIVE MARKS
3X5= 15

27. a. calculate the packing efficiency in body centered cubic crystals (3)
b. calculate the number of particles per unit cells in f.c.c. (2)
17. a. the boiling point of benzene is 353.23K .when 1.80 g of a non volatile , non electrolytic solute was dissolved in 90 g of benzene , the boiling point was raised to 354.11 K calculate the molar mass of the solute [K_b for benzene =2.53K.kg mol⁻¹]
(3)
b. write two differences between ideal and non ideal solutions of two liquids
(2)
- 4 a). calculate the standard free energy change for the following reaction occurring in the galvanic cell at 298K



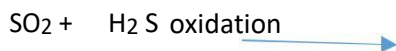
Given $E^\circ_{\text{Mg}^{2+}/\text{Mg}} = -2.37 \text{ V}$ and $E^\circ_{\text{Al}^{3+}/\text{Al}} = -1.66 \text{ V}$ (4)

b. what is primary battery?

30. a. Derive the integrated rate equation for the rate constant of a first order reaction (4)

b. what is pseudo first order reaction ? (1)

31. a. complete and balance the following reactions



b. Mention two characteristics of enzyme catalysis (2)

c. What is the sign of ΔS for the adsorption of gas on solids ?

21.

ANSWER

ANY FOUR

OF THE

FOLLOWING .

EACH

QUESTION

CARRIES FIVE

MARKS

4X5=20

32. a. Explain SN^1 mechanism by taking tertiary butyl bromide as an example (3)

b. What is Wurtz Fitting's reaction ? Give an example (2)

33. a. How is phenol manufactured by cumene process. Give the chemical equations of the reaction involved . (3)

b. How do you prepare ethanol by using the Grignard Reagent? (2)

34. a. How is Benzol chloride converted into benzaldehyde ? Name the reaction (3)

c) Write the chemical equation for the reaction between dilute NaOH and acetaldehyde, mention the name of the product formed .

(2)

24. a. Explain how is Hinberg's reagent is used to distinguish the primary, secondary and tertiary amines

b. Write the chemical reactions involved in the conversion of aniline into phenol (2)

36. a. What are carbohydrates ?and how are they classified ? (3)

b. What is a peptide bond ? How many peptide bonds are present in a tetra peptide ? (2)

37. a. i) what are condensation polymers ? Give an example.

ii) Give the IUPAC name of the monomer of natural rubber. (3)

b. What are Biodegradable polymers ? Give an example (2)

