SUBJECT: CHEMISTRY-34 **BLUE PRINT-1** **CLASS: II PUC**

Question Paper Part	Question Type	Number of Questions	Marks
PART - A	MCQ's	15/15	15/15
PART - A	Fill in the blanks	05/05	05/05
PART -B	Short Answer (SA = 02 Marks)	03/05	06/10
PART - C	Short Answer (SA = 03 Marks) Inorganic Chemistry	03/05	09/15
PART - C	Short Answer (SA = 03 Marks) Physical Chemistry	02/04	06/12
PART- D	Long Answer (LA = 05Marks)	04/06	20/30
PART - E	Short Answer (SA = 03Marks) **Numerical problems**	03/06	09/18
	Total	**35/46**	**70/105**

WEIGHTAGE

Objectives	Number of Questions	Marks	Percentage
Remember	18	40	**≈ 40%**
Understanding	13	32	**≈ 30%**
Apply	06	12	**≈ 10%**
Hots	09	21	**≈ 20%**
Total	**46**	**105**	**100%**

SUBJECT: CHEMISTRY (34) **BLUE PRINT-1** **CLASS: II PUC**

Chapter/ Contentdomain/ Unit/ Theme	Numberof hours	Marks	LOTS (≈ 80%)												HOTS (≈ 20%)			
			Remember (≈ 40%)				Understand (≈ 30%)				Apply (≈ 10%)							
			VSA 1M	SA 2M	SA 3M	LA 5M	VSA 1M	SA 2M	SA 3M	LA 5M	VSA 1M	SA 2M	SA 3M	LA 5M	VSA 1M	SA 2M	SA 3M	LA 5M
Physical Chemistry																		
1. Solutions	14	**12**	1		1				1NP		1				1		1NP	
2. Electrochemistry	14	**13**			1				1		1		1NP				1NP	
3. Chemical Kinetics	14	**12**	1	1					1				1NP				1NP	
Inorganic Chemistry																		
4. The d & f - Block Elements	12	**10**	1	1	1		1										1	
5. Coordination Compounds	12	**11**	1		1				1				1		1			
Organic Chemistry																		
6. Haloalkanes and Haloarenes	10	**09**	1			1		1							1			
7. Alcohols, Phenolsand Ethers	12	**10**	1				1	1		1	1							
8. Aldehydes, Ketones and Carboxylic Acids	14	**12**	1			1									1			1
9. Amines	08	**07**	1				1			1								
10. Biomolecules	10	**09**	1			1	1	1										
Total Teaching Hours & Marks	**120**	**105**	**9**	**4**	**12**	**15**	**4**	**6**	**12**	**10**	**3**		**09**		**4**		**12**	**5**
Total Questions		**46**	**09**	**02**	**04**	**03**	**04**	**03**	**04**	**02**	**03**	**00**	**03**	**00**	**04**	**00**	**04**	**01**

1. Weightage = Total marks/Number of teaching hours = 105/120 = 0.875 (i.e., 0.875marks for each hour)
2. Choice = out of **46** Questions only **35** Questions are to be answered.

Note: NP = Numerical Problems; VSA = Very Short Answer (MCQ's and Fill in the Blanks); SA= Short Answer; LA = Long Answer

GENERAL GUIDE LINES:

1. Questions should not be vague and ambiguous. **Answers or concept should be available in the prescribed NCERT text book** or based on the contents in the prescribed text book.
2. Intermixing of questions of different units is not allowed. 5 marks question may be framed as (3+2) as far as possible.
3. Avoid questions from:
   a. Drawings involving 3D diagrams
   b. The boxed materials with deep yellow bar in the text book are to bring additional life to the topic and are non-evaluative.
4. Questions on numerical data given in the form of appendix, numbered tables containing experimental data and life history of scientists given in the chapters should be avoided.
5. Frame the questions in such a way to strictly avoid ½ mark evaluation (or avoid value points for ½ marks.).
6. While framing Physical chemistry units (Unit 1, 2 & 3) questions for Part -A, B and C should not be Numerical problems. The Numerical Problems of these Units should be framed only in Part-E. This division is done to make for the students to learn and attempt to solve the Numerical Problems.
7. Application and HOTS (Higher Order Thinking Skills) questions can be selected from any chapter without changing the weightage of the chapter.

GOVERNMENT OF KARNATAKA

KARNATAKA SCHOOL EXAMINATION & ASSESSMENT BOARD

MODEL QUESTION PAPER – 1

Class: II Year PUC **Academic Year:** 2024-25

Subject: Chemistry (34) **Maximum Marks:** 70

Time: 3.00 Hours **No. of Questions:** 46

Instructions

1. Question paper has FIVE parts. All parts are compulsory.
2. a. Part-A carries 20 marks. Each question carries 1 mark.
   b. Part-B carries 06 marks. Each question carries 2 marks.
   c. Part-C carries 15 marks. Each question carries 3 marks.
   d. Part-D carries 20marks. Each question carries 5 marks.
   e. Part-E carries 09 marks. Each question carries 3 marks.
3. In Part-A questions, **first attempted answer** will be considered for awarding marks.
4. Write balanced chemical equations and draw neat labeled diagrams and graphs wherever necessary.
5. Direct answers to the numerical problems without detailed steps and specific unit for final answer will not carry any marks.
6. Use log tables and simple calculator if necessary (use of scientific calculator is not allowed).
7. For a question having circuit diagram/figure/ graph/ diagram, alternate questions are given at the end of question paper in a separate section for visually challenged students.

PART-A

I. Select the correct option from the given choices. **15 ×1 = 15**

1. The role of CO_2 in Kolbe's reaction is

   a) acts as catalyst b) act as nucleophile

   c) act as weak electrophile d) act as strong electrophile.

2. In DNA, the linkage between different nitrogenous bases is

   a) phosphate linkage b) glycosidic linkage

   c) peptide linkage d) hydrogen bonding.

3. The complex $PtCl_2.4NH_3Br_2$ is treated with excess of $AgNO_3$ solution, two mole of AgBr is precipitated. The primary and secondary valence of this complex is

   a) 6 and 1 b) 6 and 2

   c) 4 and 6 d) 3 and 6

4. **Statement I:** Enantiomers are non-superimposable mirror images on each other.

   Statement II: A racemic mixture shows zero optical rotation.

   Identify the correct statement

   a) Both statement I and II are correct

   b) Both statement I and II are incorrect

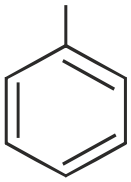
   c) Statement I is correct and statement II is incorrect.

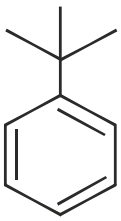
   d) Statement I is incorrect and statement II is correct.

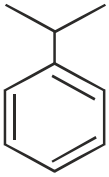
5. The most stable manganese compound is

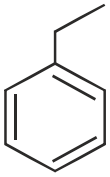
   a) Mn_2O_7 b) MnF_4 c) MnO_2 d) $MnSO_4$

6. Among the following alkyl benzenes which one will not give the benzoic acid on oxidation with acidic $KMnO_4$ solution.

a) 

b) 

c) 

d) 

7. An ambidentate ligand is

a) Cl^- b) CN^-

c) OH^- c) NO_2^+

8. The E^o of Fe^{2+}/Fe, Zn^{2+}/Zn and Sn^{2+}/Sn are –0.44 V, –0.76 V and –0.14 V respectively. Which metal/s is/are act as sacrificial electrode to protect iron from rusting?

a) Both Zn and Sn b) Zn only

c) Sn Only d) neither Zn nor Sn.

9. The chemical name of phosgene is

a) chromyl chloride b) triphenylphosphine

c) phosphorusoxychloride d) carbonyl chloride.

10. In a solution containing non-volatile solute, the mole fraction of solvent is 0.9. The relative lowering of vapour pressure is

a) 1 b) 0.1

c) 0.9 d) 1.1

11. All natural and artificial radioactive decay of unstable nuclei take place by

a) zero order kinetics b) half order kinetics

c) first order kinetics d) second order kinetics

12. Match the following

List-I	List-II
A) Glucocorticoids	i) Responsible for development of secondary female characteristics.
B) Mineralocorticoids	ii) Responsible for preparing the uterus for implantation of fertilised egg
C) Testosterone	iii) Control carbohydrates metabolism
D) Estradiol	iv) Responsible for development of secondary male characteristics.
	v) Control level of excretion of water and salt by kidney.

a) A-(iv), B- (v), C-(ii), D-(i) b) A-(iii), B-(v), C-(iv), D-(i)

c) A-(ii), B-(i), C-(v), D-(iv) d) A-(iii), B-(ii), C-(iv), D-(i)

13. p-Aminoazobenzene is prepared from benzenediazonium chloride and aniline in

a) acidic medium b) basic medium

c) neutral medium d) both acidic and basic medium.

14. The chemicals used to convert commercial alcohol into denatured alcohol are

a) $CuSO_4$ and Pyrolidine b) Cu_2S and Pyrolidine

c) $CuSO_4$ and Pyridine d) Cu_2S and Pyridine.

15. During osmosis, the solvent molecules are moving from

a) Hypotonic solution to hypertonic solution

b) Hypertonic solution to hypotonic solution

c) Higher concentrated solution to lower concentrated solution

d) Higher osmotic pressure solution to lower osmotic pressure solution.

II. **Fill in the blanks by choosing the appropriate word from those given in the brackets:**

(aldehydes, phenol, fluorobenzene, decreases, greater, benzene) **5×1= 05**

16. The melting point of interstitial compound is _____ than the pure metal.

17. Benzenediazonium fluoroborate on heating decomposes to give_____

18. The simplest hydroxy derivative of benzene is _____

19. When a non-volatile solute is added to the pure solvent, the freezing point of solvent_____

20. Ozonolysis of alkenes followed by reaction with zinc dust and water gives ____

PART-B

III. Answer ANY THREE of the following. Each question carries two marks. **3 × 2 = 06**

21. Explain Swartz reaction with an example.

22. Write the reactions show that glucose contains a) five hydroxyl groups b) aldehyde group.

23. Define half-life period of a reaction. Write the relationship between half-life period and initial concentration of zero order reaction.

24. Write the reactions involved in preparation of phenol from cumene.

25. Iron (III) catalyses the reaction between iodide and persulphate ions in the reaction:

$$2I^- + S_2O_8^{2-} \longrightarrow I_2 + 2SO_4^{2-}.$$

Explain the catalytic action of catalyst iron (III) by using chemical reactions.

PART-C

IV. Answer ANY THREE of the following. Each question carries three marks. **3 × 3 = 09**

26. Study of actinoids elements is more difficult? Give any three reasons.

27. For the complex, Mercury (I) tetrathiocyanato-S-cobaltate (III)

a) What is coordination number of Co.

b) Identify the ligand present in this complex.

c) Does ionization isomer for the following compound exist?

28. A student of 2nd PU performs two trails of reactions between KI and $KMnO_4$. In first trail student add small amount of acid to reaction mixture and in second trail student forgot to add acid to reaction mixture. Then student observed that different colour was obtained in first and second trail. Give reason for above observation. Write the possible chemical reactions to both the trails.

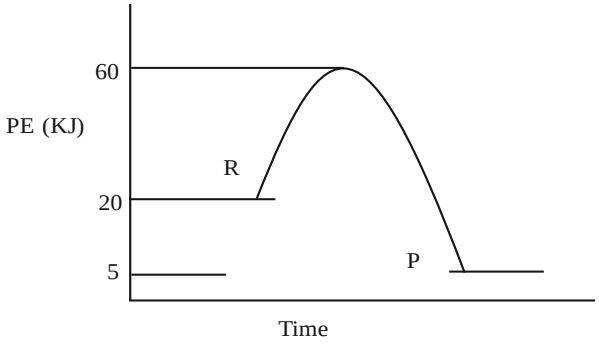
29. Define Crystal field splitting. Sketch the energy level diagram for the crystal field splitting of d-orbital in a tetrahedral complex.

30. What is the significance of synergic effect in metal carbonyls? How many bridged and non-bridged CO (carbonyl) ligands are present in octacarbonyldicobalt (0) complex compound?

V. Answer ANY TWO of the following. Each question carries three marks. **2 × 3 = 06**

31. Direct measurement of conductivity of ionic solutions by Wheatstone bridge is not possible. Give reasons. Suggest a remedy to resolve it.

32. For the reaction R(s) → P(g), the potential energy diagram is given below:



By observing the above diagram, answer the following.

a) What is the value of activation energy of the reaction?

b) What is the value of ΔH of the reaction?

c) Draw potential energy diagram for the reaction P(g) → R(s).

33. State Faraday's II law of electrolysis. Mention any two factors which determines the product of electrolysis.

34. Name the two components present in binary solution. Which component determines the physical state of binary solution?

PART-D

VI. Answer ANY FOUR of the following. Each question carries five marks. **4 × 5 = 20**

35. a) How do you distinguish between primary, secondary and tertiary amines by using Hinsberg's reagent with chemical equations involved?

b) Give the preparation of p-hydroxyazobenzene. (3+2)

36. a) Between methanal and ethanal, which would undergo aldol condensation? Write the chemical reaction involved in it.

b) Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger acid than phenol. Why? (3+2)

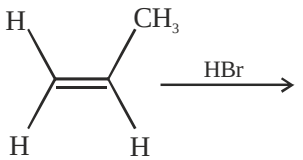
37. a) What is peptide bond? Give an example for dipeptide.

b) What are oxidoreductase enzymes? Name the enzyme that catalyses hydrolysis of maltose into glucose

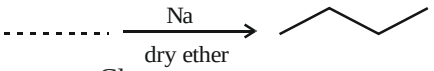
c) Give any one main natural source of Vitamin K? (2+2+1)

38. a) Complete the following equation:

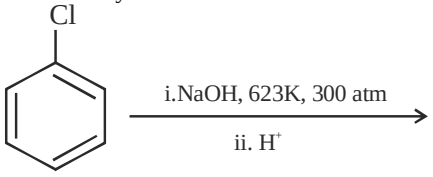
i)



ii)



iii)



b) Explain Saytzeff rule with an example. (3+2)

39. a) Give the chemical equation for the Conversion of propanenitriles into corresponding ketones by using phenyl magnesium bromide. Write the IUPAC name of the product.

b) Explain Hell-Volhard-Zelinsky (HVZ) reaction with an example. (3+2)

40. a) Write the reaction involved in the mechanism of acid catalyzed dehydration of alcohol to alkene.

b) Explain the preparation of anisole by Williamson synthesis. (3+2)

PART–E

(NUMERICAL PROBLEMS)

VII. Answer ANY THREE of the following. Each question carries three marks. 3 × 3 = 09

41. Show that in a first order reaction, time required for completion of 99.9% is 10 times of half-life ($t_{1/2}$) of the reaction.

42. A 5% solution (w/w) of cane sugar ($C_{12}H_{22}O_{11}$) in water has freezing point of 271 K. calculate the freezing point depression constant. Given freezing point of pure water is 273.15 K.

43. The molar conductivity of 0.025 mol L^{-1} methanoic acid is 46.1 S cm^2 mol^{-1}. Calculate its degree of dissociation. Given $\lambda^{o}_{(H^+)} = 349.6 \text{ S cm}^2 \text{ mol}^{-1}$ and $\lambda^{o}_{(HCOO^-)} = 54.6 \text{ S cm}^2 \text{ mol}^{-1}$.

44. Henry's law constant for the molality of methane in benzene at 298 K is 4.27 × 10^5 mm Hg. Calculate the mole fraction of methane in benzene at 298 K under 760 mm Hg.

45. Two electrolytic cells A and B containing solutions of $AgNO_3$ and $CuSO_4$ respectively are connected in series. A steady current of 1.5 amperes was passed through them until 1.45 g of silver is deposited at the cathode of cell A. How long did the current flow and What mass of copper was deposited? [Atomic mass of copper = 63.5 and silver = 108].

46. The rate constant of a reaction is given by: $\log k = 13.25 - \frac{(1.28\times10^3)K}{T}$. Calculate the activation energy and pre-exponential factor (A).

PART – F

(For visually challenged students only)

32. Give any three factors which affect a rate of reaction. 3