SUBJECT: CHEMISTRY-34 **BLUE PRINT - 2** **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	**19**	**41**	**≈ 40%**
Understanding	**12**	**31**	**≈ 30%**
Apply	**05**	**11**	**≈ 10%**
Hots	**10**	**22**	**≈ 20%**
Total	**46**	**105**	**100%**

SUBJECT: CHEMISTRY (34) BLUE PRINT-2 CLASS: II PUC

Chapter/ Content domain/ Unit/ Theme	Number of 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			1					1NP				1NP	
2. Electrochemistry	14	13			1				1				1NP		1		1NP	
3. Chemical Kinetics	14	12	1				1		1		1		1NP				1NP	
Inorganic Chemistry																		
4. The d & f - Block Elements	12	10	1		2				1									
5. Coordination Compounds	12	11	1	1	1		1								1		1	
Organic Chemistry																		
6. Haloalkanes and Haloarenes	10	09	1	1		1					1							
7. Alcohols, Phenols and 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	8	8	15	10	5	2	9	15	2		09		5		12	5
Total Questions		46	8	4	5	2	5	1	3	3	2	0	3		5	0	4	1

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 thechapters 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 ofthese 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 – 2

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

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

Time: 3.00 Hrs | **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. Square planar complex of the type [MABXL] (where A, B, X, L are unidentate) shows
   a) Two Cis and one Trans
   b) Two cis and Two trans
   c) One Cis and two Trans
   d) one Cis and One Trans

2. Order of a reaction in which unit of rate of reaction and rate constant are same
   a) 0
   b) 1
   c) 1/2
   d) 2

3. **Statement I:** Tertiary alcohols heated with copper at 573 K yields 2-methyl propene.
   Statement II: Tertiary alcohols undergo dehydration when heated with Cu /573K.
   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 in correct and statement II is correct.

4. The tanks used by most of scuba divers are filled with air diluted with helium of around
   a) 88.3%
   b) 56.2%
   c) 32.1%
   d) 11.7%

5. 1,2-dichloroethane is an example of
   a) alkylene dihalides
   b) alkylidene halides
   c) vinyl dihalides
   d) gem-dihalides.

6. A galvanic cell has electrical potential of 1.1 V. If an opposing potential of 1.1V is applied to this cell, what will happen to the cell reaction and current flowing through the cell?

a) The reaction stops and no current flows through the cell.

b) The reaction continuous but current flows in opposite direction.

c) The concentration of reactants becomes unity and current flows from cathode to anode.

d) The cell does not function as a galvanic cell and zinc is deposited on zinc plate

7. As the size of the aldehyde molecule increases, the odour becomes

a) more pungent b) more fragrant

c) less fragrant d) no change in the odour.

8. Sulphur containing amino acid is;

a) cysteine b) tyrosine

c) histidine d) proline

9. The C-O- bond angles of P, Q and R are found to be 111.7^o, 109^o, 108.9^o respectively, compound P, Q and R are

a) P = Phenol, Q = Methanol, R = Methoxy Methane.

b) P = Methoxy Methane, Q = Methanol, R = Phenol.

c) P = Methanol, Q = Phenol, R = Methoxy Methane.

d) P = Methoxy Methane, Q = Phenol, R = Methanol.

10. Compounds A and B react according to the following chemical equation $2A(g)+B(g)\longrightarrow 2C(g)$ concentration of either A or B were changed by keeping the concentrations of one of the reactants constant and the rates were measured as a function of initial concentration. Following results were obtained. Choose the correct option for the rate equation for this reaction.

Experiment trial	Initial Concentration of [A] mol L^{-1}	Initial Concentration of [B] mol L^{-1}	Initial Concentration of [C] mol L^{-1}
1	0.40	0.40	0.10
2	0.40	0.80	0.40
3	0.80	0.40	0.20

a) Rate = k $[A]^2[B]$ b) Rate = k $[A]\,[B]^2$

c) Rate = k [A][B] d) Rate = k $[A]^2$

11. The reagent useful for separation and purification of aldehydes is

a) silver nitrate solution b) sodium hydrogensulphite

c) Fehling's solution d) sodium sulphate.

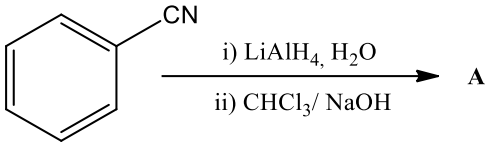
12. Match the following given in column I with Column II

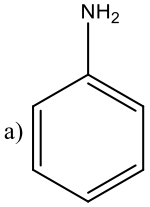
Column -I	**Column - II**
i) Chloramphenicol	A) Malaria
ii) Chloroquine	B) Anaesthetic
iii) Halothane	C) Typhoid fever
iv) Thyroxine	D) Goiter

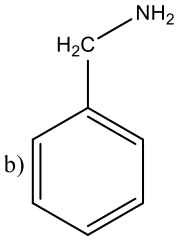
a) i-C, ii-D, iii-B, iv -A b) i-C, ii-A, iii-B, iv -D

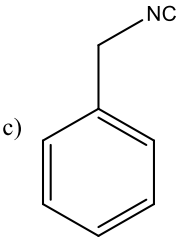
c) i-D, ii-B, iii-C, iv -A d) i-A, ii-B, iii-C, iv -D

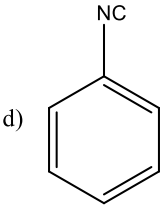
13. The product formed from the following reaction sequence is











14. The magnitude of CFSE (crystal field splitting complex, Δ_0) can be related to the configuration of d-orbitals in a coordination entity is

a) if $\Delta_0 < P$, the configuration is $t^3_{2g}e^1_g$ b) if $\Delta_0 > P$, the configuration is $t^3_{2g}e^1_g$

c) if $\Delta_0 > P$, the configuration is $t^2_{2g}e^2_g$ d) if $\Delta_0 < P$, the configuration is $t^4_{2g}e^0_g$

15. The correct order of melting point is.

a) Cr > Mn > Fe b) Fe >Mn>Cr

c) Cr > Fe >Mn d) Mn> Fe >Cr

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

(glycogen, starch, catalyst, cobalt, methanol, HNO_2) **5 × 1 = 05**

16. Storage polysaccharide present in animals is _____

17. Vitamin B_{12} is a coordination compound of _____metal

18. Primary aliphatic amines convert into aliphatic alcohols on reacting with _____ solution.

19. The chemical name of wood spirit is _____

20. Change in standard Gibbs free energy (ΔG^0) of a reaction is does not altered by the addition of ___.

PART-B

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

21. Draw a graph to show variation of vapour pressure of solvent and solution with respect to temperature.

22. Explain the preparation of methoxyethane by Willamson's synthesis. Give equation.

23. What are heteroleptic complexes? What is the co-ordination number in complex $[Co(ox)_2Cl_2]^+$.

24. Chlorobenzene cannot be prepared by reacting phenol with $SOCl_2$. Give reasons.

25. What are hormones? Name a hormone that mediate responses to external stimuli.

PART-C

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

26. When a chromite ore **'A'** is fused with sodium carbonate in free excess of air and the product is dissolved in water, a yellow solution of compound **'B'** is obtained. After treatment of this yellow solution with sulphuric acid compound **'C'** can be crystallize from the solution. When compound **'C'** is treated with KCl orange crystals of compound **'D'** is crystallizes out. Write all the reactions involved in the conversion of **'A'** to **'D'**.

27. Write the IUPAC name of $[CoCl_2(en)_2]^{+1}$. Draw the geometrical isomers for this complex.

28. Fluorine has ability to stabilize most of transition metal in higher oxidation states. Give two reasons with an example.

29. Write any three limitations of Valence bond Theory (VBT) of coordination compounds.

30. What is lanthanoid contraction? Name two elements of actinoids which exhibits +7 oxidation state in their compounds.

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

31. What is the effect of temperature on the rate constant of reaction? How can this temperature effect on rate constant be represented quantitatively**?**

32. Plot a graph of molar conductivity v/s √c for strong and weak electrolytes in solution. For strong electrolytes, write the equation that represent the variation of molar conductivity with dilution.

33. Write three reasons to justify that osmotic pressure method has the advantage over other colligative methods for the measurement of molar mass of proteins and polymers.

34. During working of Leclanche cell, Write the anodic and cathodic reaction. What is the role of produced ammonia during cell reaction?

PART-D

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

35. a) Give any two differences between amylose and amylopectin.

b) Name any two main forces which stabilize the secondary and tertiary structures of proteins.

c) Which vitamin deficiency causes the increased fragility of RBC's and muscular weakness. (2+2+1)

36. a) Write the mechanism for the addition of HCN to carbonyl compound in the presence of base.

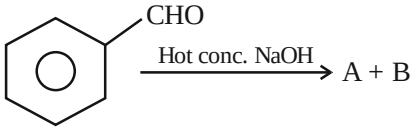
b) Aromatic carboxylic acid does not undergo Friedel crafts reaction. Give reasons. (3+2)

37. a) Explain Hoffmann broamamide degradation reaction by taking butanamide as an example. Give the IUPAC name of the product.

b) pK_b of aniline is more than that of methanamine. Give reasons. (3+2)

38. a) How do you prepare phthalimide from aromatic dicarboxylic acid? Give equation.

b) Complete the following reaction:



(3+2)

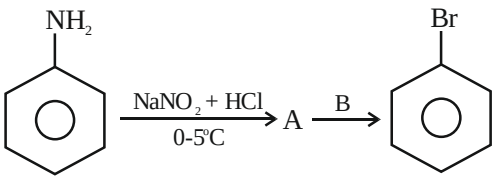
39. a) An alkene X (C_3H_6) reacts with H_2O/H^+ to give compound Y, compound Y further undergo reaction with CrO_3-H_2SO_4 to produce compound Z. Write the IUPAC name of compounds X, Y and Z.

b) Which among the following compounds have lowest and highest pK_a value? (3+2)

p-nitrophenol, phenol, ethanol and o-cresol.

40. a) Write any three differences between S_N1 and S_N2 reaction mechanisms.

b) Identify A and B in the given reaction



(3+2)

PART–E

(NUMERICAL PROBLEMS)

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

41. Calculate the mass of Vitamin C (ascorbic acid, $C_6H_8O_6$) to be dissolved in 78 g of acetic acid to lower its melting point by 1.5°C. Given: K_f of acetic acid is 3.9 K kg mol^{-1}.

42. Heptane and octane form an ideal solution. At 373 K, the vapour pressures of the two liquid components are 105.2 kPa and 46.8 kPa respectively. Calculate the vapour pressure of a solution containing of 26.0 g of heptane and 35 g of octane.

43. The electrical resistance of a column of 0.05 mol L^{-1} NaOH solution of diameter 1 cm and length 50 cm is 5.55×10^3 ohm. Calculate its resistivity, conductivity and molar conductivity.

44. Calculate the Gibbs free energy change and equilibrium constant for the cell reaction
$2Fe^{3+}(aq) + 2I^- \longrightarrow 2Fe^{2+}(aq) + I_2$. Given $E^o_{(Fe^{3+}/Fe^{2+})} = 0.77$ V and $E^o_{\left(\frac{1}{2}I_2/I^-\right)} = 0.54$ V.

45. The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature.

46. A reaction is first order in A and second order in B.
    (i) Write the differential rate equation.
    (ii) How is the rate affected on increasing the concentration of 'B' three times and decreasing the concentration of 'A' by two times?
    (iii) How is the rate affected when the concentrations of both 'A' and 'B' are tripled?