II PUC CHEMISTRY (34)
BLUE PRINT

Time: 3 Hrs.15Min   **Max. Marks: 70 marks**

Group	Unit	Name of Chapters	Teaching Hours	Marks	Part-A 20 x 1 Mark		Part B 8 x 2 Mark	Part C 8 x 3 Mark	Part D 11 x 5 Mark		Total
					I	II	III	IV	V	VI	
Group - I Physical	1	The Solid State	8	8	√		√		√		8
	2	Solution	9	8	√√	√			√		8
	3	Electrochemistry	9	8	√		√		√		8
	4	Chemical kinetics	9	9	√	√	√		√		9
	5	Surface Chemistry	6	6	√				√		6
		Total of Group - I	**41**	**39**							**39**
Group-II Inorganic	6	General principles and processes of isolation of elements	5	4	√			√			4
	7	The p-Block elements	11	11	√	√		√√√			11
	8	The d and f-block elements	9	9	√		√	√√			9
	9	Coordination compounds	7	7	√			√√			7
		Total of Group - II	**32**	**31**							**31**
Group - III Organic	10	Haloalkanes and haloarenes	7	7	√	√				√	7
	11	Alcohols, phenols and ethers	8	8	√		√			√	8
	12	Aldehydes, ketones and carboxylic acids	9	8	√		√			√	8
	13	Amines	6	6	√					√	6
	14	Biomolecules	7	6	√					√	6
	15	Polymers	5	5						√	5
	16	Chemistry in everyday life	5	5		√	√√				5
		Total of Group - III	**47**	**45**							**45**
		Total	**120**	**115**	**15**	**05**	**16**	**24**	**25**	**30**	**115**

General Guide lines:
(1) Questions should not be ambiguous and answers should be available in prescribed text book.
(2) No application type of questions in Part A. All questions should be knowledge based and moderate.
(3) In Part B, Part C and Part D, 40% questions knowledge based, 40% questions moderate and 20% questions skill and application type(difficult level).
(4) Questions should be selected from respective chapters for particular question numbers as per blue print.
(5) Part A (I): MCQ questions from units 1 to 14.
(6) Part A (II): Fill in the blank's questions from Unit 1, 4, 7, 10 and 15. In p-block elements (Unit 7) question numbers (8) and (18) are suggested to take from noble gases.
(7) For Part B, C and D, Previous years guidelines (before 2019) are applicable.

Government of Karnataka

Department of pre university education

Model question paper

CHEMISTRY (34)

TIME: 3hours 15minutes   **MAX.MARKS:70**

Instructions: i. The question paper has four parts. All the four parts are compulsory
PART -A carries 20 marks, each question carries one mark.
PART- B carries 8 marks. Each question carries two marks
PART -C carries 12 marks. Each question carries three marks
PART-D carries 30 marks. Each question carries five marks
ii. Write balanced chemical equations and draw diagrams wherever necessary
Use log table and simple calculators if necessary (use of scientific calculator
is not allowed)

PART-A

I. Select the correct option from the given choices.   **1x15 = 15**

1. Due to Frenkel defect, the density of the ionic solids

    a) Increases   b) Decreases

    c) does not change   d) Changes to a small extent

2. In which mode of expression the concentration of solution remains independent of temperature

    a) Volume percent   b) Molarity

    c) Molality   d) Formality

3. Which of the following is not colligative property

    a) Optical activity   b) Osmotic pressure

    c) Depression in freezing point   d) Elevation of boiling point

4. During the electrolysis of molten sodium chloride, the reaction occurs at anode is

    a) Chloride ions are oxidized   b) Chloride ions are reduced

    c) Sodium ions are oxidized   d) Sodium ions are reduced

5. The unit of rate constant for zero order reaction

    a) Ls^{-1} b) $L\ mol\ s^{-1}$

    c) $mol\ L^{-1}\ s^{-1}$ d) $mol\ s^{-1}$

6. In the process of adsorption

    a) $\Delta H = 0,\ \Delta S = 0$ b) $\Delta H = +ve,\ \Delta S = +ve$

    c) $\Delta H = -ve,\ \Delta S = -ve$ d) $\Delta H = +ve, \Delta S = -ve$

7. Pair of metals purified by van Arkel method is

    a) Ni and Fe   b) Ga and In

    c) Zr and Ti   d) Ag and Au

8. The noble gas which does not occur in atmosphere is

    a) Radon   b) Helium   c) Xenon   d) Krypton

9. The element which does not show variable oxidation state is

    a) Sc   b) V   c) Fe   d) Hg

10. An example of ambidentate ligand is

    a) NH_3 b) H_2O c) CN^- d) Cl^-

11. Primary alkyl halides prefer to undergo

    a) S_N1 reaction   b) S_N2 reaction   c) Addition reaction   d) Condensation reaction

12. When Phenol is treated with excess of bromine water, it gives

    a) m-bromophenol   b) o-and p-bromophenols

    c) 2,4-dibromophenol   d) 2,4,6-tribromophenol

13. In Clemmensen reduction, carbonyl compound is treated with…………to form corresponding hydrocarbon.

    a) Zinc amalgam + HCl   b) Sodium amalgam + HCl

    c) Zinc amalgam + HNO_3 d) Sodium amalgam + HNO_3

14. Amongst the following the strongest base in aqueous medium is

    a) CH_3NH_2 b) $(CH_3)_3N$ c) $(CH_3)_2NH$ d) $C_6H_5NH_2$

15. Starch is a polymer of

    a) α-D (+) Glucose   b) β-D (+) Glucose   c) α-D (+) Fructose   d) β-D (+) Fructose

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

[phosgene, terpineol, camphor, exponentially, PtF₆]   **1x5=5**

16. _____ in nitrogen gas is the example for gaseous solution

17. In a first order reaction the concentration of the reaction decreases _____ with time.

18. The first noble gas compound was prepared by reacting Xe with _____.

19. The poisonous gas _____ is formed when chloroform is exposed to air and light.

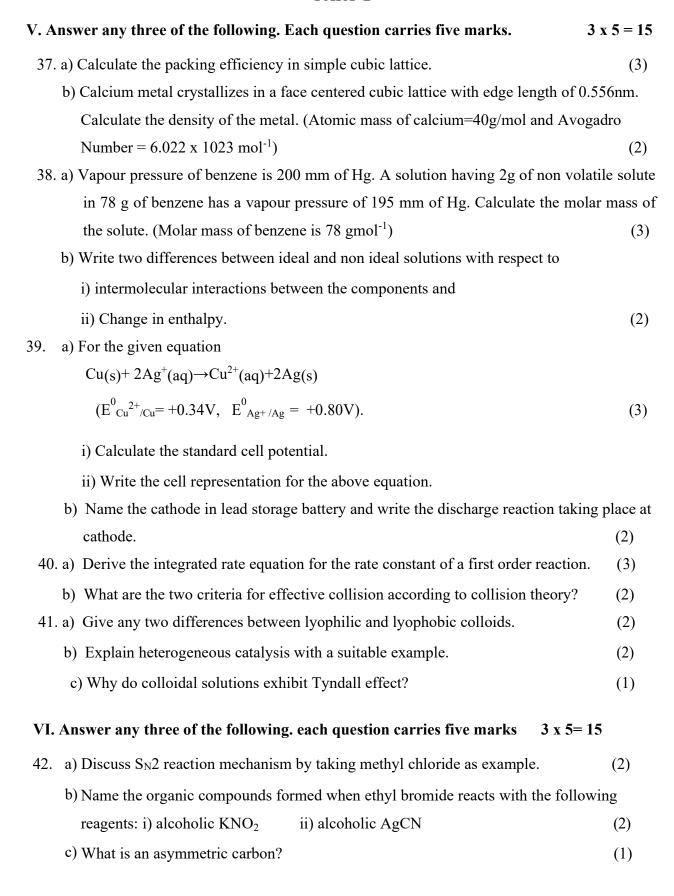20. The main constituents of Dettol are chloroxylenol and _____

PART-B

III. Answer any four of the following. Each question carries two marks.   4 x 2=8

21. Give any two differences between crystalline and amorphous solids.

22. The conductivity of a 0.20M solution of KCl at 298 K is 0.0248 Scm^{-1}. Calculate its Molar Conductivity.

23. Define molecularity. For a zero-order reaction will the molecularity be equal to zero?

24. What is lanthanoid contraction? Mention any one of its consequences.

25. i) What is the composition of Lucas reagent?

    ii) What is the inference observed when 3° alcohol is treated with Lucas reagent?

26. Explain Hell Volhard Zelensky reaction.

27. What are food preservatives? Give an example.

28. Explain saponification with an example.

PART –C

IV. Answer any four of the following. Each question carries three marks   4 x 3 = 12

29. Write the reactions involved in the process of leaching of bauxite ore to prepare pure   (3) alumina.

30. Write the optimum conditions to get ammonia by Haber'sprocess?   (3)

31. a) Give an example for each i) basic oxide   ii) neutral oxide.   (2+1)

    b) What happens when SO_2 is passed through an aqueous solution of Fe (III) salt?

32. a) Explain the bleaching action of chlorine water.

    b) Name the halogen which forms only one oxoacid.   (2+1)

33. a) Calculate the 'spin only' magnetic moment of M^{3+}(aq) ion (Z =27).

    b) Sc^{3+} is colorless. Give reason.   (2+1)

34. How is pure potassium dichromate manufactured by chromite ore?   (3)

35. On the basis of valence bond theory, explain hybridization, structure and magnetic property of the complex $[Ni(Cl)_4]^{2-}$.   (3)

36. a) Draw the energy level diagram to show splitting of degenerated orbitals in an octahedral Crystal field.

    b) Write the type of isomerism exhibited by coordinate complexes having ambidentate ligands.   (2+1)

PART-D

V. Answer any three of the following. Each question carries five marks.   **3 x 5 = 15**

37. a) Calculate the packing efficiency in simple cubic lattice.   (3)

    b) Calcium metal crystallizes in a face centered cubic lattice with edge length of 0.556nm. Calculate the density of the metal. (Atomic mass of calcium=40g/mol and Avogadro Number = 6.022×1023 mol^{-1})   (2)

38. a) Vapour pressure of benzene is 200 mm of Hg. A solution having 2g of non volatile solute in 78 g of benzene has a vapour pressure of 195 mm of Hg. Calculate the molar mass of the solute. (Molar mass of benzene is 78 $gmol^{-1}$)   (3)

    b) Write two differences between ideal and non ideal solutions with respect to

      i) intermolecular interactions between the components and

      ii) Change in enthalpy.   (2)

39.   a) For the given equation

      $$Cu_{(s)} + 2Ag^+(aq) \rightarrow Cu^{2+}(aq) + 2Ag(s)$$

      $(E^0_{Cu^{2+}/Cu} = +0.34V, \quad E^0_{Ag+/Ag} = +0.80V).$ (3)

      i) Calculate the standard cell potential.

      ii) Write the cell representation for the above equation.

    b) Name the cathode in lead storage battery and write the discharge reaction taking place at cathode.   (2)

40. a) Derive the integrated rate equation for the rate constant of a first order reaction.   (3)

    b) What are the two criteria for effective collision according to collision theory?   (2)

41. a) Give any two differences between lyophilic and lyophobic colloids.   (2)

    b) Explain heterogeneous catalysis with a suitable example.   (2)

    c) Why do colloidal solutions exhibit Tyndall effect?   (1)

VI. Answer any three of the following. each question carries five marks   **3 x 5= 15**

42.   a) Discuss S_N2 reaction mechanism by taking methyl chloride as example.   (2)

    b) Name the organic compounds formed when ethyl bromide reacts with the following reagents: i) alcoholic KNO_2 ii) alcoholic AgCN   (2)

    c) What is an asymmetric carbon?   (1)

43. a) How does ethyl alcohol reacts with Cu at 573 K. write the equation (2)

   b) Explain Kolbe's reaction. (2)

   c) Write the IUPAC name of ethyl methyl ether (1)

44. a) Explain the mechanism of addition of HCN to carbonyl compound. (2)

   b) Write the chemical equation of benzaldehyde with acetophenone in the presence of dilute alkali at 293K. Give the name of major product obtained in this reaction. (2)

   c) The pK_a value of 4-methoxy benzoic acid is greater than 4-nitrobenzoic acid. Which among them is stronger acid? (1)

45. a) Explain carbylamine reaction with suitable example. (2)

   b) Write chemical equation for the conversion of Nitro-benzene to aniline (2)

   c) Why primary amines have higher boiling point than tertiary amines? (1)

46. a) Write the Haworth structure of Lactose (2)

   b) Name the nucleic acid which is responsible for genetic information. (1)

   c) Name the vitamin responsible for coagulation of blood (1)

   d) Give an example for naturally occurring optically inactive amino acid. (1)

47. a) How is Buna-S prepared? Write the equation. (2)

   b) What are homopolymers? Give an example. (2)

   c) Write the IUPAC name of the isoprene. (1)