

SREE SIDDAGANGA PU COLLEGE FOR WOMEN, TUMKUR

DEPARTMENT OF CHEMISTRY

II PUC PRACTICE PAPER -2 (2023-2024)

Time: 3.15 Hr

Max.Marks: 70

I. Select the correct option from the given choices.

1 X15=15

- Which of the following will produce Maximum depression of freezing point by assuming complete dissociation?
a) Urea b) Aluminium sulphate c) Sodium chloride d) Potassium sulphate
- Fused NaCl on electrolysis gives..... on cathode.
a) Chlorine b) Sodium c) Hydrogen d) Sodium amalgam
- The Standard electrode potentials of four elements A,B,C and D are -3.05, -1.66, -0.40 and +0.80 volts respectively, the weakest reducing agent will be
a) B b) D c) Ad) C
- If the rate of reaction is expressed by Rate = K [A] [B], then the order of reaction will be.
a) 0 b) 1 c) 2 d) 3
- KMnO₄ acts as an oxidizing agent in alkaline medium. When alkaline KMnO₄ treated with KI, Iodide ion is oxidized to
a) IO⁻ b) I₂ c) IO₄⁻ d) IO₃⁻
- The synergic effect is observed in
a) [Cr(H₂O)₆]⁺³ b) [Co(NH₃)₆]Cl₃ c) [Ni(CO)₄] d) [Ag(NH₃)₂]⁺¹
- Grignard reagent is prepared by the action of magnesium in dry ether on
a) CH₃OH b) CH₃-CN c) CH₃-Cl d) CH₃-CHO
- Which of the following compound gives turbidity immediately on react with Lucas Reagent?
a) Butan-1-ol b) Propan -2-ol c) 2-Methylpropan -2-ol d) 2-Methylpropan -1-ol
- The reagent used to convert phenol to picric acid is
a) Bromine in carbon disulphide b) Bromine water c) Dilute nitric acid d) Concentrated nitric acid
- The organic product obtained when sodium salt of carboxylic acid heated with Sodalime is
a) Alcohol b) Aldehyde c) Alkane d) Ester
- IUPAC Name of Trimethylamine is.
a) Methanamine b) N, N- Dimethylethanamine c) N- Methylmethanamine d) N, N-Dimethylmethanamine
- An Amine (X) which reacts with benzene sulphonyl chloride to give a product 'Y' and 'Y' is soluble in alkali. The 'X' will be
a) R-NH₂ b) R-NH-R c) R-NC d) R₃N
- Benzyl alcohol is obtained from Benzaldehyde by,
a) Fittig reaction. b) Cannizzaro's reaction. c) Rosenmund's reduction. d) Etards reaction.
- Which of the following amino acid is neutral.
a) Aspartic acid b) Glycine c) Lysine d) Argenine
- Which of the following is a disaccharide.
a) Lactose b) Starch c) Cellulose d) Fructose

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

1X5=5

(Halothane, More, osmotic pressure, Molecularity, Almost similar, Less)

- The colligative Property can provide molar mass of proteins with greatest precisionis _
- _____ is applicable only for elementary reaction.
- Atomic radius of manganese is _____ when compared to Iron.
- _____ is used as an an aesthetic during surgery.
- The P_{kb} value of aniline is _____ than that of methyl amine.

PART -B

III .Answer any three of the following .Each Question carries two marks.

2X3=6

- What are isotonic solutions? Give an example.
- Define the following terms. a) Collision frequency. b) Half life Period.
- Write the IUPAC Names for the following coordinate compounds. a) [Pt(NH₃)₂ Cl₂] Cl₂ b) [Cr(NH₃)₄ Cl₂]⁺
- Complete the following reaction. (i) CH₃-CH₂-Br + alc KOH → ii) C₆H₅-Cl + CH₃-Cl $\xrightarrow{\text{Na, dry ether}}$
- How do you prepare benzaldehyde from benzene.write the equation.
- What is denaturation of proteins? Which level of structure remaining intact during denaturation of globular protein?

PART- C

IV. Answer any three of the following. Each Question carries three marks.

3X3=9

27. Explain the preparation of potassium Permanganate from Pyrolusite ore.
28. Following are the transition metal ions of 3d series. Ti^{+4} , V^{+2} , Mn^{+2} , Cr^{+2} (At.No, Ti = 22 , V =23, Cr =24, Mn= 25)
Answer the Following. i) Which ion is colourless. ii) Which ion is having half- filled d orbital electronic configuration.
iii) Write the ions in the increasing order of magnetic moment.
29. a) What is Lanthanoid contraction. b) Write the general electronic configuration of 4f series.
c) Name the gas released during the reaction of Lanthanoid elements with dilute acids.
30. a) Give an example for Neutral bidentate ligand. b) Explain the crystal field splitting in tetrahedral complexes using energy level diagram.
31. Using valence bond theory, explain the geometry, hybridization and magnetic property of tetracyanonicklate (II) ion.
32. a) Write the structure of $Fe(CO)_5$ b) Write the primary valency and secondary valency in $[Cr(ox)_3]^{3-}$ ion

V. Answer any two of the following. Each Question carries three marks.

3X2=06

33. a) State Henry's law and how solubility varies with Henry's constant (K_H)
b) Give an example for the solution in which solute is gas and solvent is solid.
34. a) Write the cell reaction for which $E_{cell} = E^0_{cell} - (RT/2F) \ln[Mg^{2+}/(Ag^+)^2]$
b) State Kohlrausch law of independent migration of ions.
35. a) Write the anodic and cathodic reaction in lead-storage battery. b) Write the SI unit of conductivity.
36. Derive the integrated rate equation for a first order reaction.

PART-D

VI. Answer any four of the following . Each Question carries Five marks.

5X4=20

37. a) Write the mechanism involved in the conversion of chloromethane to Methanol.
b) Explain Swart's reaction with an example
38. a) Write the mechanism of dehydration of ethanol to yield ethene.
b) What is Hydroboration – oxidation reaction? give an example.
39. a) Write the equations for the following . i) Catalytic reduction of butanal. ii) Reaction of methyl bromide with sodium tertiary butoxide. iii) Reaction of anisole with HI.
b) How do you convert phenol to salicylic acid by Kolbe's reaction?
40. a) Write the reagents for the following conversions.
i) Ethanal to 2- hydroxypropanenitrile. ii) Benzamide to benzoic acid. iii) Ethanoic acid to Ethanol.
b) Explain Cross aldol condensation for the formation of benzalacetophenone.
41. a) Explain Clemmensen's reduction by taking benzaldehyde as an example. b) Among formic acid and benzoic acid which one is more acidic. give reason. c) Give an example for dicarboxylic acid.
42. a) An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound 'B', which on heating with Br_2 and KOH forms compound 'C' of molecular formula C_6H_7N . write the structure and IUPAC Names of compounds A, B and C. b) How do you prepare Benzene diazonium chloride from aniline?
43. a) Write the Haworth structure of Non reducing sugar. b) name the base present only in DNA but not in RNA
c) What are essential amino acids? Is glycine an essential amino acid?

PART-E

VI. Answer any three of the following . Each Question carries three marks.

3X3=9

44. An antifreeze solution is prepared from 222.6g of Ethylene glycol ($C_2H_6O_2$) and 200g of water. Calculate the molality of the solution. If the density of the solution is 1.072 gml^{-1} then what shall be the molarity of the solution.
45. Calculate the mass of a non volatile solute (molar mass 40 g mol^{-1}), which should be dissolved in 114g of octane to reduce its vapour pressure to 80%.
46. The resistance of a conductivity cell containing 0.001M KCl solution at 298K is 1500 Ohm. what is the cell constant if conductivity of 0.001M KCl solution at 298K is $0.146 \times 10^{-3} \text{ s cm}^{-1}$.
47. Calculate the Equilibrium constant of the Reaction $E^0_{cell} = 0.46 \text{ V}$
 $Cu(s) + 2Ag^+(aq) \longrightarrow Cu^{2+}(aq) + 2 Ag(s)$
48. The rate constant of a reaction is 60 s^{-1} . how much time will it take to reduce the initial concentration of the reactant to its $1/16^{\text{th}}$ value?
49. The rate of 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. given $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$.
