

Code: A-C223123-A

I Semester Exam – 2024-25

4 x 430

Std.: XII

Sub: Chemistry

Marks: 70

Date:

Roll No.: _____

Time: 3 hr.

General Introduction :

The question paper is divided into 4 section.

1. Section-A : Q.No. 1 contains Ten multiple choice type of questions carrying one mark each.
Q.No. 2 contains Eight very short answer type of questions carrying one mark each.
2. Section-B : Q.No. 3 to Q.No. 14 are Twelve short answer type of questions carrying Two marks each. (Attempt any Eight).
3. Section-C : Q.No.15 to Q.No. 26 are Twelve short answer type of questions carrying Three marks each. (Attempt any Eight).
4. Section-D : Q.No. 27 to Q.No.31 are Five long answer type of questions carrying Four marks each. (Attempt any Three).
5. Use of log table is allowed. Use of calculator is not allowed.
6. Figures to the right indicate full marks.
7. For each Multiple Choice type Question, it is mandatory to write the correct answer along with its alphabet.

e.g. (a)/ (b)/ (c)/ (d), etc.

No marks shall be given, if ONLY the correct answer or the alphabet of the correct answer is written.

Only the first attempt will be considered for evaluation.

Section A

Q.1. Select and write the correct answer for the following multiple choice type of questions. (10)

- i) Which of the following is used as source of dichloro ?
a) Tetrachloromethane b) chloroform
c) Iodoform d) DDT
- ii) Resorcinol on distillation with Zn dust gives
a) cyclohexane b) Benzene
c) Toluene d) Benzene – 1, 3–diol
- iii) Which type of amine does produce N_2 , when treated with HNO_2 ?
a) Primary amine b) Secondary amine
c) Tertiary amine d) Both primary and secondary amine
- iv) Acetone can be reduced to propane, the reduction is called _____
a) clemmensen's reduction b) Catalytic reduction
c) Rosenmund's reduction d) Partial reduction

P.T.O.

- v) Which of the following molecule is not a lewis base ?
 a) H_2O b) BF_3
 c) NH_3 d) CO
- vi) In calculating osmotic pressure concentration of solute is expressed in _____.
 a) Molarity b) molality
 c) mole fraction d) mass per cent
- vii) If the standard enthalpy of formation of methanol is $-238.9 \text{ KJ mol}^{-1}$ then entropy change of surrounding will be _____.
 a) -801.7 JK^{-1} b) 801.7 JK^{-1}
 c) 0.8017 JK^{-1} d) -0.8017 JK^{-1}
- viii) For the reaction

$$Ni_{(s)} + Cu^{+2}_{(1M)} \rightarrow Ni^{+2}_{(1M)} + Cu_{(s)} \quad E^\circ_{\text{cell}} = 0.57\text{v}$$

 Hence ΔG° of the reaction is _____.
 a) 110 KJ b) -110 KJ
 c) 55 KJ d) -55 KJ
- ix) The reagent with which both acetaldehyde and acetone will react is _____.
 a) Fehling's solution b) Tollen's reagent
 c) Grignard reagent d) Schiff's reagent
- x) In hydrogen-Oxygen fuel cell, the carbon rods are immersed in hot aqueous solution of _____.
 a) KCl b) KOH
 c) H_2SO_4 d) NH_4Cl

Q.2 Answer the following questions.**(08)**

- i) Name the hydrocarbon formed when isopropyl bromide reacts with alcoholic KOH.
- ii) Explain the term isotonic solutions
- iii) Write relation between molar conductivity and conductivity of solution.
- iv) Write the name of reaction during conversion of phenol to salicylic acid.
- v) Write the name of product formed, when acetone is treated with 2, 4-dinitrophenyl hydrazine.
- vi) Write the formula of Hinsberg's reagent.
- vii) Aqueous solutions of which of the following salts is basic
 (i) CH_3COONa ii) NH_4Cl iii) KNO_3 iv) $CuSO_4$
- viii) The enthalpy of combustion S (rhombic) is -297 KJ mol^{-1} .
 Calculate the amount of sulphur required to produce 29.74 KJ of heat.

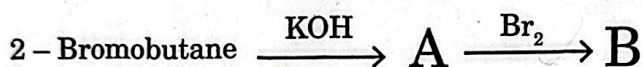
Section - B**(16)****Attempt any Eight of the following questions :****Q.3**

Calculate the mole fraction of solute, if the vapour pressure of pure benzene at certain temperature is 640 mm Hg and vapour pressure of solution of a solute in benzene is 600 mm Hg.

- Q.4 How is phenol prepared from aniline ?
- Q.5 How is Benzophenone prepared from benzonitrile ?
- Q.6 Calculate the time required to deposit 2.4 gm of Cu, when 2.03 A of current passed through CuSO_4 solution. [Atomic mass of Cu = 63.5 gm mol^{-1}]
- Q.7 Dervie the relationship between ΔH and ΔU for gas phase reactions.
- Q.8 Define cryoscopic constant. Write the SI unit of cryoscopic constant.
- Q.9 Write the chemical reactions for the following :

- a) Chlorobenzene is heated with fuming sulphuric acid
- b) Ethyl bromide is heated with silver acetate.

- Q.10 Identify 'A' and 'B' in reaction and rewrite the chemical reaction.
alcoholic



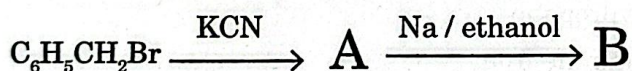
- Q.11 Derive an expression of Ostwald's dilution law for weak acid.

- Q.12 Write preparation of acetic acid from :

- i) Dry ice
- ii) Acetyl chloride

- Q.13 Why is KCl solution neutral to litmus ?

- Q.14 Identify A and B in the reaction and rewrite the chemical reaction.
alcoholic

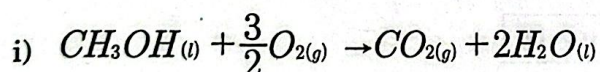


Section - C

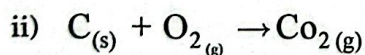
Attempt any Eight of the following.

(24)

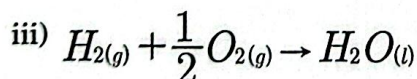
- Q.15 Calculate the standard enthalpy of formation of $\text{CH}_3\text{OH} (l)$ from the following data :



$$\Delta H^\circ = -726 \text{ KJ mol}^{-1}$$



$$\Delta H^\circ = -393 \text{ KJ mol}^{-1}$$



$$\Delta H^\circ = -286 \text{ KJ mol}^{-1}$$

- Q.16 Write chemical reactions involved in :

- a) Rosenmund reduction
- b) Gattermann koch formylation
- c) Cannizzaro reaction of methanal

- Q.17 What happens when vapours of primary, secondary and tertiary alcohols are passed over heated copper at 573 K ?

- Q.18 i) Construct a galvanic cell from the electrodes
 $\text{Co}^{+3} / \text{Co}$ and $\text{Mn}^{+2} / \text{Mn}$
 $E^\circ_{\text{Co}} = 1.82 \text{ V}$, $E^\circ_{\text{Mn}} = -1.18 \text{ V}$. Calculate E° cell.
ii) Write any two functions of salt bridge.
- Q.19 Write chemical reactions for the following conversions :
a) Ethyl bromide to ethyl methyl ether
b) Bromobenzene to toluene
c) Chlorobenzene to biphenyl
- Q.20 Derive the relationship between pH and pOH. Define buffer solution.
- Q.21 a) Derive the relationship between molar mass of the solute and elevation in boiling point.
b) State Henry's Law.
- Q.22 Define :
i) Extensive property
ii) Enthalpy of vaporisation
iii) Isobaric process
- Q.23 What are anode and cathode for Leclanche dry cell ? Write the electrode reactions and overall cell reactions when it generates electricity. Define entropy.
- Q.24 a) Give the reagents and conditions necessary to prepare phenol from :
1) Chlorobenzene 2) Benzene sulphonic acid
b) Write the structure of 2 - Ethoxypropane
- Q.25 a) Write reactions to prepare ethanamine from :
i) Acetonitrile ii) Propionamide
b) Define enantiomers
- Q.26 i) Define Osmosis
ii) Dissociation of HCN is suppressed by the addition of HCl. Explain.

Section - D

(12)

Attempt any Three of the following questions :

- Q.27 i) State the second law of thermodynamics in terms of entropy and express it mathematically.
ii) Give a simple chemical test to distinguish between ethanol and ethyl bromide.
- Q.28 i) Write a note on Gabriel phthalimide synthesis.
ii) Define : (a) Van't Hoff factor (b) Colligative property.
- Q.29 i) Explain aldol condensation of ethanal.
ii) Write the IUPAC name of isobutyraldehyde.
- Q.30 i) Explain Saytzeff's rule with suitable example.
ii) State Kohlrausch's law of independent migration of ions. Write one application of Kohlrausch's law.
- Q.31 i) Define optical activity.
ii) Define acids according to Arrhenius theory.
iii) What are the applications of the fuel cells ?