

CODE : A-C616123-A

I Semester Exam 2025-26

5 x 570

Std. : XII

Sub. : CHEMISTRY

Marks : 70

Date :

Roll No. _____

Time : 3 hrs.

General Instructions :

The question paper is divided into 4 sections.

- 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 questions carrying **one** mark each.
- 2) **Section B** - Q. No. 3 to Q. No. 14 are **twelve** short answer type questions carrying **two marks** each. (Attempt **any eight**).
- 3) **Section C** - Q. No. 15 to Q. No. 26 are **twelve** short answer type questions carrying **three marks** each. (Attempt **any eight**)
- 4) **Section D** - Q. No. 27 to Q. No. 31 are **five** long answer type 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 of question, it is mandatory to write the correct answer along with its alphabet.

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

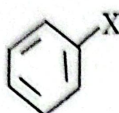
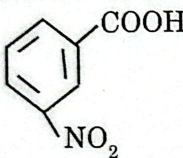
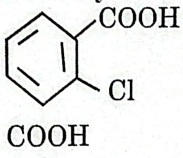
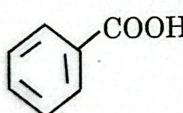
No mark (s) shall be given if **ONLY** the correct answer or the alphabet of the correct answer is written.

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 10 questions.

- 1) Which of the following pair is an intensive property ?
a) Density , Viscosity b) Surface tension , mass
c) Viscosity, internal energy d) Heat capacity , volume
- 2) The ionic produce of water will increase if _____.
a) pressure is decreased b) H^+ ions are added
c) OH^- ions are added d) Temperature is increased
- 3) The pH of 10^{-8} M of HCL is _____.
a) 8 b) 7
c) 7.04 d) 6.96
- 4) For the Reaction.
$$Ni_{(s)} + Cu^{2+}_{(1M)} \longrightarrow Ni^{2+}_{(1M)} + Cu_{(s)}, E^{\circ}_{cell} = 0.57 V.$$

Hence ΔG° of the reaction is _____.
a) 110 KJ b) - 110 KJ
c) 55 KJ d) - 55 KJ

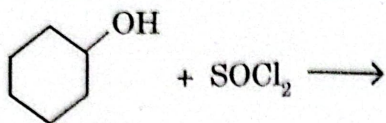
- 5) Correct IUPAC name of tert-butyl alcohol is _____.
 a) 2 - Methyl butan - 1 - ol b) 2 - Methyl butan - 2 - ol
 c) 2 - Methyl propan - 2 - ol d) 2 - Methyl propan - 1 - ol
- 6) The allylic halide among the following is _____.
 a) $\text{R} - \underset{\substack{| \\ \text{X}}}{\text{CH}} - \text{R}$ b) $\text{CH}_2 = \text{CH} - \text{X}$
 c)  d) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{X}$
- 7) Ozonolysis of 2, 3 dimethyl but - 2 - ene, followed by decomposition by Zn dust and water gives _____.
 a) acetaldehyde b) Propionaldehyde & acetone
 c) acetone d) acetaldehyde and butyraldehyde
- 8) The hybridization of nitrogen in primary amine is _____.
 a) sp b) sp^2
 c) sp^3 d) sp^3 d
- 9) Which one of the following has lowest acidity ?
 a)  b) 
 c)  d) 
- 10) Given the Reaction.
 $2\text{NH}_3(\text{g}) \longrightarrow \text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \quad \Delta H = 92.6 \text{ KJ}$
 In enthalpy of formation of NH_3 is
 a) - 92 KJ b) 92.6 KJ mol⁻¹
 c) - 46.3 KJ mol⁻¹ d) - 185.2 KJ mol⁻¹

Q. 2 Answer the following questions :

- Write an expression which define Gibb's energy.
- State Raoult's law for a solution containing a non volatile solute.
- Write IUPAC name of the following.

$$\text{H}_3\text{C} - \underset{\substack{| \\ \text{CH}_3}}{\text{CH}} - \underset{\substack{| \\ \text{CH}_3}}{\text{CH}} - \text{CH}_2 - \text{OH}$$
- Write Henderson-Hasselbalch equation for the pH of basic buffer.

- v) What is conductivity ?
- vi) Write structure and IUPAC name of product in the following reaction.



- vii) Which of the two is more basic and why ?
 CH_3NH_2 and NH_3
- viii) Why does skin have burning sensation when an ant bites ?

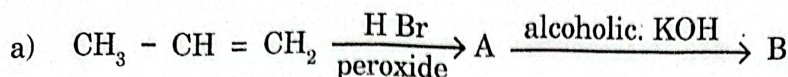
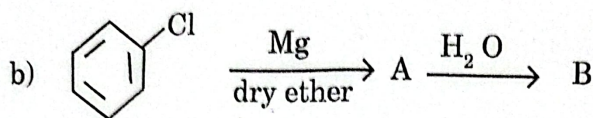
SECTION - B

Attempt any Eight questions of the following.

16

- Q. 3 Derive the mathematical expression between molar mass of a non-volatile solute and elevation of boiling point.
- Q. 4 Distinguish between Reversible and Irreversible process.
- Q. 5 Derive the relation $\text{pH} + \text{pOH} = 14$.
- Q. 6 Name the reagents used to convert phenol into
- 1) Picric acid *2,4,6-trinitrophenol*
 - 2) 2, 4, 6 tribromo phenol *conc. HNO_3 + conc. H_2SO_4 (R 2/1420)*
 - 3) Benzene *Zn*
 - 4) o - phenol sulphonic acid *conc. H_2SO_4*
- Q. 7 Write note on Wurtz - Fitting reaction.
- Q. 8 How will you prepare ethanamine from.
- 1) ethyl iodide
 - 2) Methyl Cyanide (Acetonitrile)
- Q. 9 State Hess's law of constant heat summation illustrate with example.
- Q. 10 Draw neat & labelled diagram of Dry cell.
- Q. 11 State and explain Saytzeff's rule with suitable example.
- Q. 12 What is Grignard reagent ? How is ethanoic acid prepared from dry ice ?
- Q. 13 If 20.0 cm^3 of $0.05 \text{ M Ba}(\text{NO}_3)_2$ are mixed with 20.0 cm^3 of 0.02 M NaF , will BaF_2 precipitate ?
 [K_{sp} of BaF_2 is 1.7×10^{-6} at 298 K]

Q. 14 Complete the following reactions giving major product.



SECTION - C

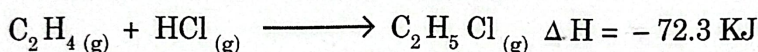
Attempt any Eight of the following questions.

24

Q. 15 Define : i) Isotonic Solution
ii) Reverse Osmosis
iii) Van't Hoff factor.

Q. 16 What are conditions under which $\Delta H = \Delta U$. What is the enthalpy of atomization.

Q. 17 Calculate ΔU at 298 K for the reaction.



How much PV work is done.

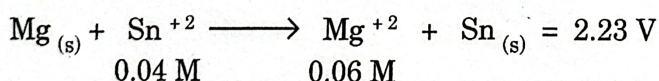
Q. 18 Give the reactions when vapours of primary, secondary & tertiary alcohol are passed over hot copper.

Q. 19 Why aniline does not undergo Friedel - Craft's reaction using aluminium chloride. ?

Q. 20 At 25°C 0.1 molal solution of CH_3COOH is 1.35 % dissociated in an aqueous solution. Calculate freezing point and osmotic pressure of solution assuming molarity or molality to be identical.

Q. 21 Derive relationship between degree of dissociation & dissociation constant for weak base.

Q. 22 Calculate E_{cell} and ΔG for the following at 28°C :

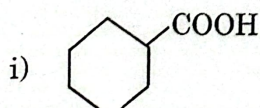
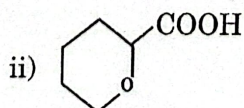
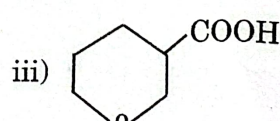


Is the reaction spontaneous ?

Q. 23 Discuss SN^1 mechanism of tert - butyl bromide using aq.KOH.

Q. 24 Write the reactions for discharging in lead accumulation.

Q. 25 Arrange the following carboxylic acids with increasing order of their acidic strength and justify your answer.



Q. 26 Give reaction of ethanal and propanal in presence of dil. NaOH.

SECTION - D**Attempt any Three of the following questions.****12**

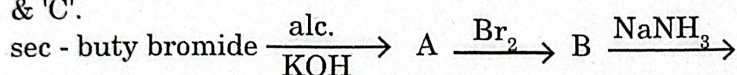
Q. 27 How is standard enthalpy of formation useful to calculate Standard enthalpy of reaction. Explain value for Van't Hoff factor for electrolyte & non-electrolyte.

Q. 28 Give reaction : i) Phenol treated with bromine water.
ii) Reimer - Tiemann reaction
iii) Give two uses of phenol.

Which amide produces ethanamine by Hoffmann Bromamide degradation.

Q. 29 Explain determination of molar conductivity of weak electrolyte at infinite dilution using Kohlrausch's law.

Q. 30 i) Complete the following reaction sequences by writing the structural formula of 'A' 'B' & 'C'.



ii) State any two environmental effects of DDT.

Q. 31 i) Compound A ($\text{C}_5\text{H}_{10}\text{O}$) forms phenyl hydrazone and gives negative Tollen's reagent test and iodoform test. on reduction with Zn - Hg / HCl compound A gives n - pentane. Write the structure of A.

ii) Why anions are Lewis base ?

