Progressive Education Society's

Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16, NEP 2020 (Autonomous)

End Semester Examination: MAR / APR 2025

***Total No. of Questions**: 4/18(Each Section)* ***Total No. of Pages**:03*

SECOND YEAR (NEP Version I)
COURSE CODE: CHE-24101
COURSE NAME: Electroanalytical and Organic Chemistry
(Semester IV)

Program: B.Sc. General **Credits:** 4
Program Specific: S.Y.B.Sc. (Chemistry) **Time:** 3 Hours
Course Type: MAJOR **Max. Marks:** 60
Paper: I **SET: A**

Instructions to the candidate:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw a well labelled diagram wherever necessary.*
4) ***Answer both sections on separate answer sheets.***

SECTION I: ELECTROANALYTICAL CHEMISTRY (30 Marks)

Q1) Answer the following: **[5 x 1= 5]**

1. Define specific conductance.
2. Give the formula to determine molarity.
3. What is critical solution temperature?
4. State Raoult's law.
5. Name any two colligative properties.

Q2) Attempt ANY FIVE of the following: **[5 x 2 =10]**

1. Calculate cell constant of a conductivity cell with electrodes 1.5 cm apart and having an area of cross section of 2.5 cm^2.
2. Calculate specific conductance of 0.5 N solution with equivalent conductance of 28.2 mho cm^2.
3. Draw the P-N and T-N diagrams for systems with maximum vapour pressure.
4. Define ideal and non-ideal solutions.
5. Explain the T-C diagram of system with minimum critical solution temperature with an example.
6. A mixture of 'A' and 'B' contains 60% by weight of A. Calculate mole fraction of 'A' in the mixture, when molecular weight of 'A' and 'B' is 120 and 90 respectively.
7. Explain term osmosis and osmotic pressure.

Q3) Attempt ANY TWO of the following: **[2 x 5 = 10]**

1. At 25°C, the equivalent conductance of 0.0125 N acetic acid is 16.14 mho cm^2. The equivalent conductance at infinite dilution for acetic acid is 390.8 mho cm^2. Calculate dissociation constant of acetic acid at 25°C.
2. Explain the working of fractionating column with help of a diagram.
3. Explain Berkeley-Hartley method to determine osmotic pressure.
4. Explain Landsberger's method to determine elevation of boiling point.

Q4) Attempt ANY ONE of the following: **[1 x 5 = 5]**

1. The conductivities at infinite dilution of NH_4Cl and NaOH are 129.8 and 248.7 mho cm^2 respectively. Ionic conductivities of Na^+ and Cl^- ions are 50.1 and 76.3 mho cm^2 respectively. Specific conductivity of 0.01 N NH_4OH is 9.6 x 10^{-5} mho cm^{-1}. Calculate degree of dissociation of 0.01 N NH_4OH solution.

2. Derive the equation for relative lowering of vapour pressure.

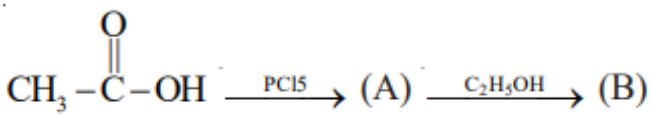
SECTION II: ORGANIC CHEMISTRY (30 Marks)

Q1) Answer the following. **[5 X 1 = 05]**

1. Explain the term Dihedral angle.
2. What is iodoform test?
3. What is silver mirror test?
4. What is Configuration?
5. Give one distinguishing test for aldehydes and ketones.

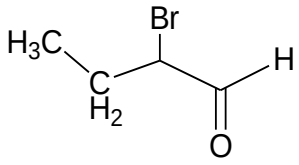
Q2) Answer the following (Attempt any 5/7) **[5 X 2 = 10]**

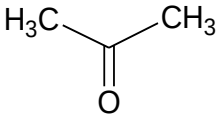
1. Why acetaldehyde does not undergo Cannizaro's reaction?
2. Trans isomer is gererally more stable than cis-isomer. Explain.
3. Benzaldehyde does not undergo aldol condensation. Explain.
4. What are aldehydes? How will you prepare acetaldehyde from ethyl alcohol?
5. Identify the product 'A' and 'B' and rewrite the reaction



6. Draw the structure of 3-chloropentanal and 2-butanone.

7. Give the IUPAC name of following compounds

a) 

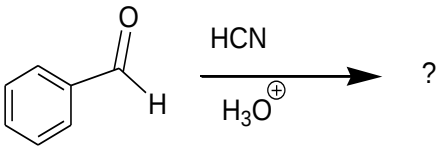
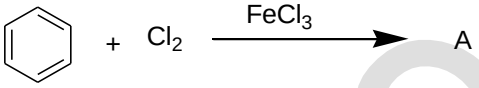
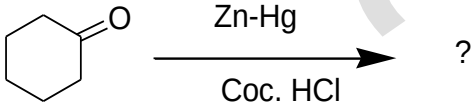
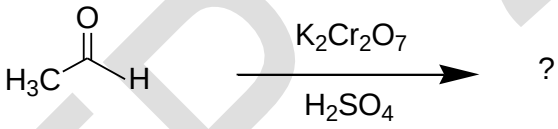
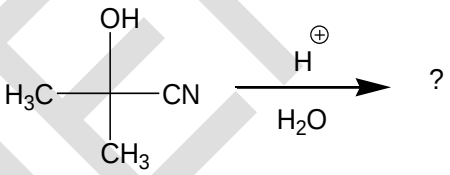
b) 

Q3) Answer the following (Attempt any 2/4) **[2 X 5 = 10]**

1. Write short note on Meerwein-Pondorff Varley Reduction.
2. 2-Butanine does not give silver mirror test. Explain.
3. What are carboxylic acids? How will you prepare Acetic acid from ethyl acetate?
4. Write preparation of oximes of benzaldehyde and acetone.

Q4) Answer the following (Attempt any 1/2) **[1 X 5 = 05]**

1. Write note on Reformatsky reaction.
2. Identify the products.

1.	
2.	
3.	
4.	
5.	

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