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Total No. of Questions : 20

Total No. of Pages : 02

M.Sc. (Chemistry) (2018 & Onwards) (Sem.–1) PHYSICAL CHEMISTRY-I Subject Code : CHL-403-18 M.Code : 75115

Time : 3 Hrs.

Max. Marks : 70

## INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains EIGHT questions carrying FIVE marks each and students have to attempt any SIX questions.
- 3. SECTION-C will comprise of Two compulsory questions, with INTERNAL CHOICE. Each question carries TEN marks.

## SECTION-A

Answer briefly :

Q1 What is Chemical Potential? Write down its chemical formula.

- Q2 Write down the expressions of partial molar free energy and partial molar entropy with explaining different parameters involved.
- Q3 What is half wave potential in polarography?
- Q4 Write down Lippmann equation with meaning of different parameters involved.
- Q5 Write down the conditions in which activity coefficient tends to unity.
- Q6 What is a thermodynamic criterion for an ideal solution?
- Q7 What is meant by Electrical Double Layer?
- Q8 Draw conductometric titration graph of strong acid with weak base. Cite an example.
- Q9 Write down the equation related with the rate constant value according to Lindemann theory of unimolecular reaction.
- Q10 Write down the relation between ionic strength of a solution with activity coefficient with meaning of the parameters involved.

### SECTION-B

- Q11 Derive the expression for chemical potential of an ideal gas.
- Q12 Write a short note on 'Primary Isotope Effect'.
- Q13 Calculate the ionic strength of a solution obtained by mixing equal volume of 0.01 M NaCl and 0.02 M AlCl3 solution.
- Q14 Write a short note on 'Collision Theory'.
- Q15 Molar ionic conductance at infinite dilution of Na+ and Cl– ions are 50 × 10-4 and 76 × 10-4 Sm2mol-1 respectively at 25°C. Calculate the transport number of Na+ and Cl– ions.
- Q16 Write a short note on 'Hinshewood theory of unimolecular reaction.'
- Q17 Illustrate the important applications of polarography.
- Q18 Write a short note on 'Flash Photolysis.'

# SECTION-C

Q19 Discuss in details the kinetics of opposing reaction.

### OR

Illustrate the advantages of dropping mercury electrode (DME}.

Q20 Briefly discuss Kohlrausch's law and give suitable examples of its applications.

OR

Write a short note on stopped flow method for studying kinetics of fast reactions.

# NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.