Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 19

M.Sc (Chemistry) (Campus) (2015 to 2017) (Sem.-1)

PHYSICAL CHEMISTRY-I (THERMODYNAMICS AND ELECTROCHEMISTRY)

Subject Code : CHL-403

M.Code : 51142

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 SIX questions carrying FIVE marks each and students have to attempt ALL questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Define chemical potential. Write down the expression for chemical potential.
2. What are non-ideal solutions? give examples?
3. What is ionic strength and how it is measured?
4. What is triple point and eutectic mixture?
5. What is the phase rule for two-component and three component systems?
6. Describe briefly Lindemann theory of a unimolecular reaction.
7. State stationary or steady state principle.
8. Explain the Debye-Falkenhagen effect.
9. What do you mean by concentration polarization, how it is different from overvoltage?
10. Write down the Onsager equation for conductance of binary strong electrolyte.

SECTION-B

11. Describe the Debye-Huckel theory for determination of activity coefficients of electrolytic solutions.

12. Draw and describe the phase diagram for partially miscible three-liquid system having one partially miscible pair.

13. Define fast reactions. How fast reactions are studied by stopped flow method?

14. Describe the Gouy-Chapman theory for electrical double layer.

15. Describe the primary salt and secondary salt effect on reaction rates.

16. Define polarography. Derive the Ilkovic equation.

SECTION-C

17. Define partial molar quantity and derive Gibbs-Duhem equation. How partial molar volume can be determined from method of intercept?

18. Describe the Hinshelwood theory of unimolecular reactions. What are the limitations associated with this theory?

19. What is activity coefficient and mean ionic activity coefficient? Describe in detail Debye-Huckel theory of strong electrolytes.

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.