

(i) Printed Pages: 3

Roll No.

(ii) Questions : 9

Sub. Code :

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B.A./B.Sc. (General) 4th Semester
(2053)

CHEMISTRY

(Same for B.Sc. Microbial & Food Technology)

Paper—XV : Physical Chemistry—B

Time Allowed : Three Hours]

[Maximum Marks : 22

Note :—Attempt **FIVE** questions in all, selecting at least **ONE** question each from Units I to IV. Question No. 9 (Unit V) is compulsory.

UNIT—I

1. (a) Draw a well labelled diagram of S (Sulphur) system and discuss briefly its metastable triple point. 3
(b) What is the importance of phase rule ? 1
2. (a) Discuss the salient features of the phase diagram of Pb-Ag system and explain desilverization of lead on the basis of this phase diagram. 3
(b) Why Mg-Zn system is considered to be a system with congruent melting point ? 1

UNIT—II

3. (a) State Kohlrausch's law. How can it be used to determine ionic product of water ? 2
- (b) What do you mean by 'Transport Number' ? Briefly describe Hittorf's method for the determination of transport number of Ag^+ and NO_3^- in AgNO_3 solution when electrodes of platinum are used. 2
4. (a) Briefly describe the importance and limitations of Ostwald's dilution law. 2
- (b) How do specific conductivity and equivalent conductivity vary with dilution and why ? 2

UNIT—III

5. (a) Why Calomel electrode is preferred over hydrogen electrode as a reference electrode ? Give the reactions occurring on the Calomel electrode. 2
- (b) How equilibrium constant of a cell reaction can be determined from EMF measurements ? 2
6. (a) The standard EMF of the cell $\text{Ni}|\text{Ni}^{2+}||\text{Cu}^{2+}|\text{Cu}$ is 0.59 volt. The standard electrode potential (reduction potential) of copper electrode is 0.34 volt. Calculate the standard electrode potential of nickel electrode. 2
- (b) Name different types of reversible electrodes. Also give one example each. 2

UNIT—IV

7. (a) What do you understand by 'Hydrogen overvoltage' ?
What are the factors on which it depends ? 2
- (b) Describe the potentiometric method to determine the solubility of a sparingly soluble salt. 2
8. (a) Describe the construction and working of a quinhydrone electrode. 2
- (b) Calculate the EMF of the concentration cell consisting of zinc electrodes, one immersed in a solution of 0.01 M concentration and other in a solution of 0.1 M concentration of its ions at 25°C. 2

UNIT—V

9. (a) What is the difference between eutectic point and cryohydric point ?
- (b) Give the basic cause of concentration polarization.
- (c) Define Nernst Distribution Law.
- (d) What is the relationship between ionic conductance and ionic mobility ?
- (e) Explain liquid junction potential.
- (f) What is meant by electrode potential and standard electrode potential ? $1 \times 6 = 6$