



SECTION – D

(Answer **any two** questions)

19. a) Write the principle of steam distillation.
 b) When an immiscible liquid A was steam distilled with water, it gave a distillate 200 ml of which contains 57.2 ml of A. The boiling point for distillation was found to be 98.2°C at a pressure of 758 τ . At this temperature the vapour pressure of water was 712 τ . If the density of the liquid is 1.83g ml⁻¹ what is the molar mass of liquid A.
20. Describe briefly various types of electrodes which can be used for determining the pH of the solution. Discuss the merits and demerits.
21. Write the proton transfer theory of acids and bases. Discuss the effect of solvent on the relative strength of acid and bases. **(Weightage : 2×4=8)**



Reg. No. :

Name :

VI Semester B.Sc. Degree (CCSS – Reg./Supple./Improv.)

Examination, May 2015

CORE COURSE IN CHEMISTRY

6B13 CHE : Physical Chemistry – II

Time : 3 Hours

Max. Weightage : 25

SECTION – A

(Answer **all** the questions)

1. i) H₂O molecule belongs to the following point group
 a) C_{3v} b) C_{2v} c) D_{2d} d) D_{2h}
- ii) Isotonic solutions have the same
 a) osmotic pressure b) vapour pressure
 c) atmospheric pressure d) internal pressure
- iii) Van't Hoff factor for dilute solution of urea is
 a) 1 b) 0
 c) greater than 1 d) less than 1
- iv) The number of phases present in a mixture of three gases O₂, N₂ and CO₂ is
 a) one b) two c) three d) zero
2. i) Completely miscible solution can be separated by
 a) using separating funnel b) evaporation
 c) fractional distillation d) none of these
- ii) The liquid mixtures which distil with a change in composition are called _____ mixtures.
 a) Azeotropic b) Equilibrium
 c) Azeotropic d) Non equilibrium



- iii) _____ do not show Tyndall effect.
- a) Suspension b) Colloidal solution
c) True solution d) None of these
- iv) Which of the following has the highest flocculating power ?
- a) Na⁺ b) Ba²⁺ c) Pb²⁺ d) Al³⁺
3. i) If the degree of dissociation of weak electrolyte at a certain temperature is 0.1, the percentage of the undissociated molecule will be _____
- a) 10 b) 20 c) 50 d) 90
- ii) In a binary electrolyte AB of certain concentration, the transport number of cation is 0.4, then the transport number of anion will be _____
- a) 0.2 b) 0.4 c) 0.6 d) 0.8
- iii) The λ^0 for K⁺ ion is 73.52 Ohm⁻¹ cm⁻¹ g equi⁻¹. Its ionic mobility will be _____
- a) 73.52/96500 b) 73.52 × 96500
c) 73.52 + 96500 d) 73.52 – 96500
- iv) The solubility of a salt is S and the solubility product is 4S³ The ratio of cation to anion in the salt is
- a) 1 : 1 b) 1 : 2 c) 1 : 3 d) 2 : 3
4. i) When HCl gas is passed through a saturated solution of NaCl, the solubility of NaCl will
- a) decrease b) increase
c) remains the same d) become zero
- ii) The pH of a solution is 4, its hydroxide ion concentration is
- a) 10¹⁰ b) 10⁻¹⁰ c) 10⁻⁴ d) 10⁴
- iii) The site of oxidation in an electrochemical cell is
- a) cathode b) anode
c) cathode and anode d) none of these
- iv) The cell potential is equal to E⁰ when the equilibrium constant becomes
- a) 0 b) 1 c) 10 d) 100

(Weightage : 4×1=4)

SECTION – B

(Answer any five questions)

5. What do you mean by improper axis of rotation ?
6. With the help of Clausius-Claperon equation predict the effect of pressure on the melting point of ice.
7. What is meant by critical micelle concentration ?
8. The molecular mass of acetic acid calculated from boiling point elevation method is 117 g mol⁻¹. Calculate Van't Hoff factor.
9. The molar conductance of 0.01 M acetic acid was found to be 16.30 × 10⁻⁴ S m² mol⁻¹ at 25°C Molar conductance at infinite dilution was 390.7 × 10⁻⁴ S m² mol⁻¹. Calculate the degree of dissociation.
10. Write the theory of acid base indicators.
11. What is liquid junction potential ? How will you eliminate liquid junction Potential ?
12. Define the term ionic mobility. (Weightage : 5×1=5)

SECTION – C

(Answer any four questions)

13. Construct the multiplication table for C_{3v} point group.
14. How will you show that osmotic pressure is a colligative property ?
15. Explain the emulsifying action of soap.
16. The specific conductance of a saturated solution of silver chloride at 25°C after subtracting the specific conductance of water is 2.28 × 10⁻⁴ S m⁻¹. Calculate the solubility of silver chloride. Given λ_m^0 of silver chloride is 138.3 × 10⁻⁴ S m² mol⁻¹.
17. What are the advantages of conductometric titrations ?
18. Explain the term concentration polarization. (Weightage : 4×2=8)