

- (b) Explain the following : **2,2,2,2**
- (i) Eutectic point
 - (ii) Pattinson's Process
 - (iii) Triple point
 - (iv) Transition point.

Unit III

6. (a) Explain Specific Conductivity and Molar conductivity and also explain their variation with dilution. **8**
- (b) Derive Handerson Hesselbalch equation for Basic buffer solution. **8**
7. (a) Explain the principle of conductometric titration. How conductance changes when strong acid titrated against weak base, explain ? **8**
- (b) Explain the following : **2,2,2,2**
- (i) Degree of hydrolysis
 - (ii) Importance of buffer solutions
 - (iii) Transport number
 - (iv) Ionic Product of water.

Subject Code—52556

B. Sc. EXAMINATION

(Main/Reappear) (Batch 2018 Onwards)

(Third Semester)

CHEMISTRY

CCL-304

Course–V

Physical Chemistry-II (Solutions, Phase
Equilibrium Conductance and Electrochemistry)

Time : 3 Hours

Maximum Marks : 80

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory. All questions carry equal marks. Provide log table or simple calculator when required.

1. (a) Why some solutions show Negative deviations ? Give one example.

- (b) Explain the principle of steam distillation.
- (c) What is the difference between Thaw point and Boiling point ?
- (d) Is it possible to have a quadruple point in phase diagram of one component system ? Explain.
- (e) The resistance of 0.05 N NaCl solution at 298K is 100 ohms. Cell constant of conductivity cell is unity. Calculate the equivalent conductance of the solution.
- (f) What do you know about acidic buffer solutions and its chemistry ? Explain.
- (g) What is Calomel standard electrode ? Explain.
- (h) Write down principle of potentiometric titration. 2×8=16

Unit I

2. (a) Explain Raoult's Law of solutions for ideal and non-ideal solutions. And draw vapour pressure-composition diagram for each type solutions. 12

- (b) A solution containing 72 g of solute dissolved in two litre of water gave an osmotic pressure 6.75 atmosphere at 27°C. The molal elevation constant of water is 0.52 K kg mol⁻¹. Calculate the boiling point of the solution. 4
3. (a) Derive thermodynamically the relation between Elevation on boiling point and molecular mass of the solute. 8
- (b) Explain CST for phenol water system. How CST affected by impurities ? Explain. 8

Unit II

4. (a) Explain the Phase diagram of Sulphur System. 8
- (b) Show that $F = C - P + 2$ and explain each terms involved in it. 8
5. (a) Derive and give importance of Clausius Clapeyron equation. 8

Unit IV

8. (a) Derive Nernst equation for gas electrode.

8

- (b) Zinc electrode is placed in 0.1 M solution of zinc sulphate at 25°C. If the degree of dissociation of salt at this concentration is found to be 0.95. Calculate the electrode potential of the electrode at 25°C, given that $E^0_{Zn.Zn_2+} = 0.76$ volt . 8

9. (a) Explain the EMF of concentration cell without transference. 8

- (b) How Quinhydrone electrode is used to determine the pH of solution ? Explain. 8