

4th Semester TDC Examination (Non-CBCS)

Subject – Chemistry (Major)

Course – MM-401 (Physical Chemistry)

Full marks – 12

Time = 1 h

1. Answer any *six* questions from the following:

2 x 6 = 12

- a) Write Kohlrausch's law of independent migration of ions. Explain with an example.
- b) Write down the variation of molar conductance in weak and strong electrolytes.
- c) Define specific conductance. Explain why specific conductance decreases with dilution.
- d) The equivalent conductances of aqueous CH_3COONa , HCl and NaCl at infinite dilution are 91, 426.1 and 126.1 $\text{ohm}^{-1} \text{cm}^2 \text{equiv}^{-1}$ respectively. Calculate the equivalent conductance of CH_3COOH at infinite dilution.
- e) What is cell constant and how is it measured?
- f) A decinormal solution of KCl having the specific conductance 1.12 S m^{-1} shows the resistance 55 ohm with a conductivity cell. Calculate the cell constant?
- g) Describe standard hydrogen electrode.
- h) If the standard electrode potential of $\text{Zn(s)} | \text{Zn}^{2+}(\text{aq})$ and $\text{Cu(s)} | \text{Cu}^{2+}(\text{aq})$ electrodes are -0.76 V and $+0.34 \text{ V}$ respectively, then calculate the standard e.m.f. of the cell?
- i) Define Carnot cycle. Write the expression for the efficiency of the Carnot cycle.