MCH13 — PHYSICAL CHEMISTRY – I

Time : Three hours   Maximum : 75 marks

SECTION A — (5 × 6 = 30 marks)

Answer ALL questions.

1. (a) Discuss the variation of chemical potential with temperature and pressure.

Or

    (b) Explain the determination of fugacity of gases by graphical method.

2. (a) Draw and discuss the phase diagram for sodium chloride – water system.

Or

    (b) Draw and discuss the phase diagram for a three component system for water - ethyl alcohol – succinic acid.

3. (a) What is CMC? What are the factors which will affect the CMC?

Or

    (b) Discuss the Donnan membrane equilibrium.

4. (a) Discuss the kinetic Isotope effects.

Or

    (b) Derive Bronsted-Bjerrum equation and explain its significance.

5. (a) What is the effect of pH and temperature on enzyme catalysed reactions?

Or

    (b) Explain the mechanism of acid-base catalysed reaction.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

6. Explain the determination of activity and activity coefficient for non electrolyte.

7. How are three component system studied with the help of the phase rule. Discuss briefly the system $CH_3COOH - CHCl_3 - H_2O$.

8. Write a note on :

    (a) Gold number

    (b) Sedimentation potential

    (c) Electro osmosis.

9. Derive Eyrings equation and explain its significance.

10. Derive Michaelis-Menten equation and explain its significance.