Exam. Code : 210403
Subject Code : 4834

M.Sc. Chemistry 3rd Semester
SURFACE & POLYMER CHEMISTRY
Paper—Course-XVIII

Time Allowed—Three Hours] [Maximum Marks—50

Note :—Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The **fifth** question may be attempted from any section. Log Tables may be asked for.

SECTION—A

1. Explain the difference between the following :
   (a) Surface tension and surface energy
   (b) Physical and chemical adsorptions
   (c) Temporary and permanent catalytic poisons
   (d) Adsorption isotherm and adsorption isobar.

   2,3,3,2

2. (a) Is adsorption an endothermic or exothermic process ? Justify your answer thermodynamically.
   (b) Derive Laplace equation and mention its consequences.
   (c) How will you estimate the surface area of an adsorbent by using BET adsorption isotherm ?

   2,5,3

SECTION—B

3. (a) Outline the characteristic features of surface active agents.
   (b) Describe various factors affecting the CMC.
   (c) Elaborate the role of an emulsifier in the stabilization of an emulsion.
   (d) What are hydrophobic interactions ? Give their significance. 3,3,2,2

4. (a) Discuss the thermodynamics of micellization.
   (b) Give an account of mass action models.
   (c) Enlist applications of micro-emulsions. 4,4,2

SECTION—C

5. (a) Describe osmometric method for the determination of molecular mass of a polymer.
   (b) Discuss the kinetics of step polymerization.
   (c) Equal masses of polymer monomers with molecular weight 10000 and 15000 were mixed. Calculate number-average and mass-average molecular masses. 3,3,4

6. (a) Enlist advantages of electrically conducting polymers over the pure metallic conductors.
   (b) Give an account of liquid crystal polymers.
   (c) What is the need of vulcanization in rubbers ? Give vulcanization reactions of rubbers by sulphur. 2,4,4

SECTION—D

7. Discuss in detail the various factors that influence the polymer structure and properties. 10

8. Write notes on the following :
   (a) Chain topology
   (b) Polymer utilization
   (c) Tm-Tg relationship
   (d) Plasticity of polymers. 4×2½