

Exam. Code : 210403

Subject Code : 4940

M.Sc. Chemistry 3rd Semester (Batch 2020-22)

SURFACE AND POLYMER CHEMISTRY

Paper : Course—XVIII

Time Allowed—3 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. All questions carry equal marks. Log Tables may be asked for.

SECTION—A

1. (a) Derive Kelvin equation for vapor pressure of droplets.
- (b) Outline various factors that decrease the catalytic activity at the surfaces.
- (c) Consider two liquids A and B such that A has half the surface tension and twice the density of B. If liquid A rises to a height of 2.0 cm in a capillary, what will be the height to which liquid B will rise in the same capillary ? 3,3,4
2. Define and explain the following :
 - (a) Surface energy
 - (b) Capillary action
 - (c) Adsorption isobar
 - (d) Electro-kinetic phenomena
 - (e) Catalytic poisons. 5×2

SECTION—B

3. (a) Discuss in detail, the concept of solubilization giving suitable examples.
(b) Describe various factors affecting the CMC of surfactants.
(c) What is micellization? Discuss the thermodynamics of micellization. 3,3,4
4. Explain the following :
(a) Micro-emulsions
(b) Hydrophobic interactions
(c) Reverse micelles
(d) Detergent action of soap. 4×2½

SECTION—C

5. (a) Describe sedimentation method for the determination of molecular mass of a polymer.
(b) A polymer contains equal number of monomers with molecular masses 20000 and 30000. Calculate the number-average and mass-average molecular masses. 5,5
6. Write notes on the following :
(a) Electrically conducting polymers
(b) Liquid crystal polymers
(c) Fire resistant polymers. 4,4,2

SECTION—D

7. (a) Discuss the kinetics of radical polymerization.
(b) Outline the physical properties of solid polymers.
(c) Discuss thermodynamics of polymerization. 3,3,4
8. Give an account of various factors that affect the polymer structure and properties. 10