



ICS 504

III Semester M.Sc. Degree Examination, April/May 2022
INDUSTRIAL CHEMISTRY
Polymers and Soft Materials

Time : 3 Hours

Max. Marks : 70

- Instructions :** 1) Answer **any five** questions from Part – A and **any five** questions from Part – B.
 2) Figures to the **right** indicate marks.

PART – A

Answer **any five** questions.**(5x2=10)**

1. a) What are thermoplastics ? Give one example and its application.
- b) Define polydispersity. What is its significance ?
- c) State the principle of reverse osmosis.
- d) Give an example and an application of a biodegradable polymer.
- e) Mention any two applications of liquid crystals.
- f) State the parameters that are used to describe the liquid crystals.
- g) Explain the principle of MOCVD technique of thin film preparation.
- h) Give any two properties and applications of thin films.

PART – B

Answer **any five full** questions.**(5x12=60)**

2. a) Discuss in detail the different ways of classifying polymers.
- b) Define and explain the terms number average, weight average and viscosity average molecular weight of polymers.

(6+6)**P.T.O.**



3. a) What are elastomeric materials ? Describe in detail the structural features which impart elastic nature to these materials.
b) Explain the importance of additives in improving polymer properties.
c) Write a note on dry melt spinning. (6+3+3)
4. a) Discuss the application of polymers in
i) Nano filtration
ii) Electrodialysis.
b) Explain the medical application of polymers in targeted drug delivery systems. (6+6)
5. a) Describe the preparation and uses of polymer blend and composites.
b) What are nano composites ? Explain any one synthetic route of nano composites.
c) Write a note on application of polymers in food industry. (6+3+3)
6. a) Explain nematic, smectic and cholesteric phases of liquid crystals.
b) Discuss in detail the optical properties of liquid crystals. (6+6)
7. a) Write a note on :
i) Lyotropic liquid crystals.
ii) LED materials.
b) What are NLO materials ? What are the essential conditions for an organic molecule to exhibit NLO properties ?
c) Explain briefly the theoretical treatment of liquid crystals. (6+3+3)
8. a) What are Langmuir-Blodgett films ? Explain the principle and procedure for their preparations. Mention the applications of these films.
b) Explain :
i) sol-gel method of preparation of thin films.
ii) Photolithography. (6+6)
9. a) What are fullerenes ? How are they prepared ? Explain the superconductivity of doped fullerenes.
b) Write a note on :
i) Organic superconductors
ii) Magnetism in organic materials. (6+6)