

1059
M.Tech. (Material Science and Technology)
Second Semester
MST-205: Polymers

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Attempt the following:-
 - a) What is crystallite melting point of a polymer? On what factors it depend? Discuss the different arrangements adopted by crystalline polymers. (3)
 - b) What is thermoforming? (2)
 - c) Discuss the importance of acid as catalyst in condensation polymerization. (1)
 - d) Discuss specific volume change of semicrystalline polymer with temperature. (1)
 - e) What are the various methods to produce biobased polymers? Give biomedical use of (i) polyethylene (ii) polyamide. (3)

UNIT - I

- II. a) Derive an expression for degree of polymerization in cationic addition method. Why these are carried at low T and what is the effect of solvent polarity on it?
- b) Discuss how molecular weight control can be obtained in condensation polymerisation. (2x5)
- III. a) Discuss the molecular wt. determination of any polymer sample using viscosity measurement method.
- b) What is gel permeation chromatographic technique? How it is useful for polymers? (2x5)
- IV. a) Compare suspension polymerization technique with emulsion polymerization.
- b) Discuss synthesis of nylon using ring opening polymerization method. (2x5)

UNIT - II

- V. a) What is polymer processing? Discuss a technique used to make thin films or sheets of any polymer.
- b) Discuss in detail the compounding of polymers? Why it is required? Discuss one fibre spinning techniques. (2x5)

P.T.O.

(2)

- VI. a) What are various factors responsible for polymer degradation? Discuss any one of them and how it can be prevented?
- b) Discuss with examples the modification of polymers by chemical reactions. (2x5)
- VII. a) What are conducting polymers? What are their types? Explain the conduction behavior using one example.
- b) What are the requisites for a polymer to show liquid crystal behaviour. Explain taking one example. Also discuss various uses of liquid crystal polymers. (2x5)

x-x-x