



JAZ-003-1103003

Seat No. _____

M. Sc. (Sem. III) Examination

December - 2019

Physical & Material Chemistry : C(PM) - 303
(Macromolecular Physical Chemistry - II) (New Course)

Faculty Code : 003

Subject Code : 1103003

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) All questions are compulsory.
(2) All questions carry equal marks.

1 Answer the following : (any seven) 14

- (a) Define: Morphology, Fiber, Plastic, Glass transition temperature.
- (b) Explain Calendaring.
- (c) Write note on end group analysis.
- (d) Differentiate between :
 - (i) First order and second order phase transitions.
 - (ii) Proper volume and empty volume.
- (e) What are advantages and disadvantages of composites.
- (f) What are safety and industrial fibers? Explain.
- (g) Describe chain branching.
- (h) What are globular crystals ?
- (i) Explain the relation between glass transition temperature and melting temperature.
- (j) Give an account of biocomposites.

2 Answer the following : (any two) 14

- (a) Explain injection and thermo forming in detail.
- (b) Discuss the determination of number average molecular weight by vapor pressure osmometry.
- (c) Describe thermodynamics of melting and crystallization of polymers.

- 3** Answer the following : **14**
- (a) Explain the determination of free volume in polymers.
 - (b) Derive an expression for the determination of intrinsic viscosity and viscosity average molecular weight.

OR

- 3** Answer the following : **14**
- (a) What is composite? Give the classification of composites and explain each in detail.
 - (b) Discuss molecular weight determination by sedimentation equilibrium method.

- 4** Answer the following : **14**
- (a) Explain Spray and hand lay methods in detail.
 - (b) Describe cryoscopy and ebulliometry.

- 5** Answer the following : (any two) **14**
- (a) Discuss the fractionation of polymers by GPC.
 - (b) Explain extrusion and compression moldings.
 - (c) Discuss the mechanism and kinetics of polymer crystallization.
 - (d) What is viscosity? Discuss various types of viscosities with equations. Give the significance of all the terms involved in these equations.