

B. Tech. Fourth Semester (Polymer (Plastic) Technology) (Old)
Polymer Chemistry - I : 4 SPP 2

P. Pages : 2

Time : Three Hours



AU - 3117

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Diagrams and chemical equations should be given wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. Discuss the reaction, mechanism wherever necessary.
 6. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Define Polymer. Explain the classification of polymer on the basis of method of formation, crystallinity and line structure. 6

- b) Discuss Block and Graft copolymers with suitable examples. 8

OR

2. a) Give the structural formula and IUPAC names of the following polymers. 7

i) Polystyrene

ii) Polyethylene terephthalate

- b) Compare thermoplastics with thermosetting polymers on the basis of thermal response. 7

3. a) How will you prepare vinyl chloride monomer using laboratory method and commercial method? 8

- b) Explain important properties of butadiene monomer. 5

OR

4. Discuss the manufacturing process of following monomers with flow diagram : 13

i) Propylene

ii) Butadiene

5. a) Explain GLC method used for the analysis of monomer and polymer. 6

- b) Name the methods used for physical and chemical analysis of monomer and polymer. Discuss NMR technique. 7

OR

6. Explain the following methods used for analysis of monomer and polymer. 13

i) IR

ii) X-ray Diffraction

SECTION – B

7. a) What is functionality concept and how would you determine functional groups? 6
b) Derive Carothers equation and state its application. 7

OR

8. Describe in detail the distinctive features of polyaddition and polycondensation. 13
9. a) How would you determine the molecular weight of polyvinyl - chloride (PVC) using viscosity measurement method? Explain in detail. 7
b) Explain the ultracentrifugation method used for molecular weight determination of polymer. 7

OR

10. Explain the number average and weight average molecular weight of polymer. What are the different methods used for molecular weight determination of polymers? Discuss end group analysis method used for molecular weight determination. 14
11. a) What is degradation of polymer? State different types of degradation. 6
b) Explain oxidative type degradation and how it is stabilized. 7

OR

12. What is thermal degradation of PVC? State its mechanism. How would you prevent the degradation in PVC polymer, discuss in detail with suitable stabilizer (ingredients)? 13

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