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Total Number of Pages : 01

M.Sc  
19MSPS102

1<sup>st</sup> Semester Regular Examination 2019-20

POLYMERIC MATERIALS

BRANCH : M.Sc.(PS)

Time : 3 Hours

Max Marks : 100

Q.CODE : HR643

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.  
The figures in the right hand margin indicate marks.

Part- I

- Q1** Answer the following questions : (2 x 10)
- a) Differentiate between thermoplastics and thermosets. (2)
  - b) What are synthetic polymeric materials? Give examples. (2)
  - c) What is "Delrin"? Mention its applications. (2)
  - d) What are engineering plastics? Give examples. (2)
  - e) What is PTFE? Write its structure and applications. (2)
  - f) What are polyurethanes? (2)
  - g) Define a nanofiller. Mention the advantages of nanofillers with suitable examples. (2)
  - h) Give examples of polymeric materials for biomedical applications. (2)
  - i) What are glassy amorphous polymers? Give examples. (2)
  - j) Mention any two bioplastics. Give their applications. (2)

Part- II

- Q2** Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (8 x 6)
- a) What are polyolefins? Discuss with suitable examples. (6)
  - b) Differentiate between novolac resins and resols. (6)
  - c) What are copolymers? Mention various types of copolymers with examples. (6)
  - d) Differentiate commodity, engineering and high performance plastic materials with suitable examples. (6)
  - e) What are melamine formaldehyde resins? Briefly discuss on manufacturing, properties and applications of melamine formaldehyde resins. (6)
  - f) What are aromatic polyamides? Discuss on any one aromatic polyamide. (6)
  - g) What are unsaturated polyester resins? Briefly discuss on their synthesis. (6)
  - h) What are silicones? Mention their properties and applications with suitable example (6)
  - i) Differentiate between petroleum based PE and bio-PE. (6)
  - j) What are the raw materials used in the manufacturing of DGEBA epoxy resins? Briefly discuss on the synthesis of DGEBA epoxy resin. (6)
  - k) What are polyesters? How are they manufactured? (6)
  - l) What is PLA? Briefly explain the manufacturing and properties of PLA. (6)

Part-III

- Only Long Answer Type Questions (Answer Any Two out of Four) (16x2)**
- Q3** Discuss in detail the manufacturing of polypropylene using Ziegler- Natta catalyst. (16)  
Mention the properties and applications of polypropylene.
- Q4** How is Nylon 6,6 manufactured? Give a detailed account on properties and applications of Nylon 6,6. (16)
- Q5** What are polysulfones? Discuss in detail the manufacturing, properties and applications of poly (ether sulfone). (16)
- Q6** With a neat sketch discuss the manufacturing of phenol formaldehyde resins in the presence of acid catalyzed reactions. What are the applications of phenol-formaldehyde resins? (16)