

Total No. of Questions : 12]

SEAT No. :

**P1203**

[Total No. of Pages :3

[4659] - 317

**B.E. (Polymer)**

**FIBER TECHNOLOGY**

**(2008 Course) (Elective - I) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Answer any three questions from each section.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right side indicate full marks.*
- 5) *Use of Calculator is allowed.*
- 6) *Assume Suitable data if necessary.*

**SECTION - I**

- Q1)** a) Briefly explain Criteria for fiber forming polymers. [6]
- b) Among silk, cotton, nylon and polyester (PET) which one are natural fibers and synthetic fibers? Justify your answer. [6]
- c) Comment on characteristics and uses of silk fiber. [6]

OR

- Q2)** a) Tri-functional monomers are not suitable to synthesize fiber grade polymers. Is statement true or false? Justify. [6]
- b) Explain in detail why two-stages are preferred over single step while polymerizing fiber grade PET. [6]
- c) Write down the raw materials, their chemical structures and reactions involved in synthesis of fiber grade PET and Nylon 66 polymers. [6]

- Q3)** a) What are various types of quench system used in melt spinning operation? Draw appropriate schematic diagram and, alongwith merits and demerits explain any one system. [8]
- b) Write a short note On Dry - jet wet spinning technique used to manufacture fibers. [8]

OR

***P.T.O.***

**Q4) a)** With schematic diagram explain how shear and elongational flow velocity gradients vary with the distance from spinneret exit. [8]

b) Why orientation of molecules due to shear flow is in effective compared to that due to elongational flow in case of melt spinning? [8]

**Q5) a)** Briefly comment on the functions of spin finish. [8]

b) What are chemical constituents present in spin finish formulation? What are their functions? [8]

OR

**Q6) a)** Write a short note on Dipping roller technique used in coating spin finish during spinning operation. [8]

b) With schematic diagram explain the concept of textured and non-textured filament. What is texturing process? [8]

### **SECTION - II**

**Q7) a)** With examples explain classification of natural and synthetic fibers. [9]

b) Why identification is necessary for fibers. Explain in detail with few test required. [9]

OR

**Q8) a)** What are the advantages of synthetic fibers over natural fibers? [9]

b) Explain what are staple fibers and give method used for obtaining either natural or synthetic staple yarn. [9]

**Q9) a)** What is the difference between dyeing and mass coloration. Explain techniques used for mass coloration for any one polymer. [8]

b) What are acid and basic dyes. Explain the terms chromophore and vat dye. [8]

OR

**Q10)a)** Explain disperse dyeing and also carrier dyeing with their advantages and disadvantages. [8]

b) Explain high temperature and thermosol dyeing techniques. [8]

**Q11)a)** Explain what are microfibers and what is their speciality. [8]

b) Write a note on Spandex and give the reason behind the properties attained by this fiber. [8]

OR

**Q12)a)** Explain why fibers are modified and explain with few examples. [8]

b) Explain the terms bi-component fibers, Also explain the modified fiber obtained from Nylons. [8]

