Reg. No. : | | | | | | | | | | | |

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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Annual Pattern — First Year

Textile Technology

TTIX 01 — POLYMER SCIENCE AND TEXTILE FIBRE PRODUCTION

(Common to Textile Technology (Textile Chemistry))

(Regulation 2004)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are Ziegler-Natta catalysts? Give two examples.

2. Outline the types of copolymers that can be obtained from monomers M_1 and M_2.

3. Distinguish between LDPE and HDPE.

4. What are the structural requirements of a polymer to be useful as a fibre forming material?

5. What is glass transition temperature? Give its significance.

6. What do you understand by the term tacticity?

7. Mention the need for drawing in fibre production.

8. What are safety fibres? Mention their applications.

9. List the varieties of cotton.

10. Distinguish between natural and synthetic fibres.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the determination of weight average molecular weight by light scattering method. (8)

(ii) Describe briefly the different polymerization techniques. (8)

Or

(b) (i) Explain the determination of number average molecular weight by osmometry. (8)

(ii) With a neat diagram explain the functioning of a GPC instrument. (8)

12. (a) (i) Describe the preparation and applications of polyvinyl chloride, polypropylene and polyester. (9)

(ii) Summarize the preparation properties and applications of carbon fibres. (7)

Or

(b) (i) Explain the preparation properties and applications of conducting and super absorbing polymers. (8)

(ii) Compare the physical and chemical properties of polyacrylonitrile polyurethane, polycarbonates and nylon 6,6. (8)

13. (a) (i) Discuss the relation between structure of polymers and crystallinity, solubility and strength. (8)

(ii) Describe the various parts of a melt spinning line. (8)

Or

(b) (i) Briefly explain the different types of spinning processes employed in the production of fibres. (9)

(ii) Write a note on chemical and weather resistant characteristics of polymers. (7)

14. (a) (i) Explain the principle and types of texturisation. (8)

(ii) Explain the spin draw process. (8)

Or

(b) (i) Describe the need and composition of spin finishes. (8)

(ii) Write a short note on heat setting. (8)

15. (a) (i) Explain briefly the various steps involved in the cotton cultivation and fibre production. (8)

(ii) Write a note on wool shearing and grading. (8)

Or

(b) (i) Explain the jute cultivation and fibre extraction. (8)

(ii) Compare the properties of wool, silk and jute fibres. (8)