[This question paper contains 4 printed pages.]

Your Roll No. .....

3174 **J**

M.E. Polymer Technology

Paper—CH.601

(Advanced Fibre Technology)

Time : 3 *Hours* *Maximum Marks* : 100

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any ***five*** *questions.*

All *questions carry equal marks.*

1. (a) Explain the following terms in respect of fibres : 10

   (i) Tenacity

   (ii) Elongation at Break

   (iii) Breaking Length

   (iv) Staining Test

   (v) Burning Test.

   (b) Give details of the manufacturing and uses of Viscose Rayon Fibres. 10

2. (a) Enlist the reasons to produce acetone soluble cellulose acetate fibres. 4

   (b) Discuss about the production, properties and uses of cellulose acetate fibres. 16

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3. (a) Write about the melt spinning process. Illustrate primary, secondary and resulting variables. Report their relationship also. 10

(b) Discuss about the preparation, properties and uses of any *one* of the following :

(i) Low Density Polyethylene fibres

(ii) High Performance Polyethylene fibres

(iii) Carbon fibres

(iv) Polyvinyl Alcohol fibres

(v) Polyester fibres. 10

4. (a) What do you understand with the pollution caused by a textile industry ? Suggest the methods for its abatement. 8

(b) Describe about the heat treatment and texturising of fibres. Report its advantages also. 6

(c) Give brief about the following : 6

(i) Felting and Weaving.

(ii) Knitting and Lacing.

5. (a) Explain the term stabilization of a polymerization process. Support with example. 4

(b) How do you prepare fibre grade Nylon-6,6 ? Illustrate its spinning also. 8

(c) Write about the additives used to prepare thermally stable and fatigue free Nylon-6,6 fibres for Tyre Industry. 4

(d) Comment on the surface grafting of Nylon-6,6 fibres and their applications. 4

6. (a) Write about the dyeing affinity of fibres and dyeing variables. 4

(b) Give brief of *any two* of the following : 8

(i) Congo Red Dyes,

(ii) Mordant Dyestuff,

(iii) Green Dyes,

(iv) Natural Dyes.

(c) Discuss about the dry solution spinning process. Mention its merits and demerits also. 8

7. (a) Describe the structural principles of fibre forming polymers. 5

(b) Give brief of any *three* of the following : 15

(i) Flame Resistant Fibres,

(ii) Animal Fibres,

(iii) Glass Fibres,

(iv) Cotton Fibres,

(v) Metallic Fibres.

8. Write short notes on *any four* of the following : $4 \times 5 = 20$

(a) Nylon-6 fibres,

(b) Acrylic fibres,

(c) Polyvinyl chloride fibres,

(d) Microscopical Examination of fibres,

(e) Density Gradient Tube Test,

(f) Esthetic Behaviour of fibres.