

**17341****21314**

3 Hours/100 Marks

Seat No.

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- Instructions :**
- (1) **All** questions are **compulsory**.
 - (2) Answer **each** next main question on a **new** page.
 - (3) **Illustrate** your answers with neat sketches **wherever** necessary.
 - (4) Figures to the **right** indicate **full** marks.
 - (5) **Assume** suitable data, if **necessary**.
 - (6) **Use** of Non-programmable Electronic Pocket Calculator is **permissible**.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.

MARKS1. Attempt **any ten** :**20**

- a) What are the characteristics of fibre forming polymers ?
- b) Enlist and explain in brief the different methods of fiber manufacturing (polymerisation).
- c) What is condensation polymerisation ? Give one example.
- d) Give two examples of fibres formed by addition polymerisation method.
- e) Define normal denier polyester and micro denier polyester.
- f) Draw the chemical structure of the raw materials used in the manufacturing of polyester.

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**MARKS**

- g) Draw chemical structure of Dacron polymer of polyester.
- h) Mention any four physical properties of Nylon 66.
- i) Enlist the parameters on which the polymerisation of caprolactum depends.
- j) Mention the burning and solubility characteristics of polyamide fibres.
- k) Write the chemical formula and names of any two co-monomers used in the manufacturing of acrylic fibres.
- l) Define acrylic fibres and modacrylic fibres.
- m) Compare HDPE and LDPE (on any two points).
- n) What are Glass fibres ?
- o) Write any two brand names and manufacturers name of spandex fibres.

2. Attempt any four :**16**

- a) Enlist and explain the essential requirements of melt spinning.
- b) Write the chemical properties of PET.
- c) With a neat line diagram, give the manufacturing process of CDPET.
- d) Justify any four uses of Nylon 6 and Nylon 66.
- e) Explain with reactions, the ethylene and acetylene route of manufacturing acrylonitrile.
- f) Write a note on the composition of glass fibres.



MARKS

16

3. Attempt **any four** :

- a) Explain the chemistry involved in the formation of fibre structure during spinning.
- b) Enlist and explain the parameters to be maintained during winding and drawing of polyester filaments.
- c) Give the synthesis of raw materials used in the manufacturing of polyesters.
- d) Write a note on the differentially dyeable nylon and mention any four uses.
- e) With a schematic diagram, explain the wet spinning method of manufacturing PAN. Mention its advantages and limitations.
- f) Write a note on the different types of polyethylene.

4. Attempt **any four** :

16

- a) Explain the theory of solidification of polymers in melt spinning techniques.
- b) With a neat schematic diagram, give the manufacturing process of micro denier polyester fibres.
- c) Write a note on the purpose and types of modification of polyester.
- d) Explain the method of manufacturing flame retardant and low pilling nylons.
- e) Write a detailed note on the classification of nylons.
- f) Write any four physical and four chemical properties of acrylic fibres.

5. Attempt **any two** :

16

- a) Write a detailed note on the various spinning equipments used in the manufacturing of polymers by melt spinning technique.
- b) How are acrylic fibres modified to impart hydrophilic and low pilling properties ?
- c) Write down any four physical and chemical properties each of carbon and spandex fibres.



6. Attempt **any two** :

16

- a) Explain the concept of LOY, MOY, POY and FOY yarns.
 - b) With a neat schematic diagram, explain the manufacturing process of Nylon 6 and Nylon 66.
 - c) Write down the manufacturing process of polyethylene and polypropylene fibres. Write any two physical and two chemical properties of polyethylene and polypropylene fibres.
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