17341

21415

3 Hours/100 Marks

Seat No. | | | | | | | | |

Instructions *: (1)* ***All*** *questions are* ***compulsory****.*
(2) Answer ***each*** *next* ***main*** *question on a* ***new*** *page.*
(3) ***Figures*** *to the* ***right*** *indicate full marks.*
(4) Abbreviations used convey usual meaning.

MARKS

1. Answer **any five** : **(5×4=20)**
   a) Describe theory of solidification of polymers in melt spinning technique.
   b) Explain principle of direct melt-spinning.
   c) In relation to polyesters for fibres, comment on :
      i) Level of crystallinity
      ii) Moisture regain
      iii) Action of concentrated sulphuric acid
      iv) Suitable solvents.
   d) Explain in general, hydrogen-bonding in nylons.
   e) Describe antistatic nylon.
   f) Define bicomponent fibres. State their characteristics.
   g) What are 'Lycra' fibres ? State their uses.

2. Answer **any two** : **(2×8=16)**
   a) Explain general features and essential requirements of melt spinning.
   b) i) Describe process of polymerise $\in$ - caprolactam. **6**
      ii) 1) Name the method of polymerisation and the polymer formed.
      2) Write reaction involved in the polymerisation of $\in$ - caprolactam. **2**
   c) i) Indicate with reactions only, preparation of PAN based carbon fibres. **2**
      ii) State applications of carbon fibres. **3**
      iii) State characteristics of glass fibres. **3**

P.T.O.

MARKS

3. Answer **any two** : **(2×8=16)**

   a) With the help of a flow-diagram write stepwise procedure to manufacture PET.

   b) i) Describe hydrogen bonding in PAN fibres. **2**

      ii) State physical-chemical and thermal-properties of PAN fibres. **6**

   c) i) Compare properties of PE and PP fibres.

      ii) Explain uses of PE fibres.

4. Answer **any two** : **(2×8=16)**

   a) In relation to melt spinning :

      i) Explain function of quenching zone.

      ii) Describe take-up winder.

   b) i) Draw the flow-sheet for the manufacture of nylon 66.

      ii) Compare properties of nylon 6 and nylon 66.

   c) Describe manufacturing process of PP fibres.

5. Answer **any two** : **(2×8=16)**

   a) Explain concept of :

      i) MOY yarn ii) HOY yarn.

   b) i) Explain meaning of low-pilling polyester. **2**

      ii) What is 'CDPET' ? Represent its structural formula. **2**

      iii) State properties and applications of polyester micro fibres. **4**

   c) i) Define modacrylate fibres. Write its typical composition. **2**

      ii) Describe manufacturing process of modacrylate fibres. **6**

6. Answer **any four** : **(4×4=16)**

   a) Explain purpose of 'static device'.

   b) Classify saturated polyesters as linear/cross linked. Why is dimethyl terephthalate preferred to terephthalic acid in manufacture of polyesters ?

   c) How is flame-retardancy achieved in a polyester ?

   d) Explain in general, uses of nylon fibres.

   e) Explain differentially dyeable nylons.

   f) Write uses of acrylic fibres.

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