

22457

23124

3 Hours / 70 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.
 - (8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

Marks

- 1. Attempt any FIVE of the following:** **10**
- a) Define condensation polymerisation and give one example of it.
 - b) Enlist any four physical properties of viscose rayon.
 - c) Draw the chemical structures of the monomer raw materials used for the manufacturing of Dacron.
 - d) Define 'Polyester microfibre' and compare with conventional polyester (one point).
 - e) Suggest the names of monomers used in the manufacturing of Nylon 66 and draw its structures.
 - f) Enlist any four chemical properties of acrylic fibres.
 - g) Enlist any two monomers used in the manufacturing of polyolefin fibres.

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- 2. Attempt any THREE of the following:** **12**
- a) Differentiate between LDPE and HDPE on the basis of chemical properties. (Any four points)
 - b) Describe the desired polymer characteristics for melt spinning method.
 - c) Describe with a neat labelled sketch, the procedure of using density gradient column to identify acetate rayons.
 - d) Describe the procedure adopted to determine accessible regions of PET by using iodine absorption method.
- 3. Attempt any THREE of the following:** **12**
- a) Describe the procedure to determine the average molecular weight of Nylon 66 by end group analysis method.
 - b) Describe with justification, the important spinning parameters for the manufacturing of Nylon 6 fibres.
 - c) Illustrate with a flow chart, the manufacturing process of acrylic fibres.
 - d) Select and elaborate relevant melt spinning parameter for the manufacturing of poly propylene fibres.
- 4. Attempt any THREE of the following:** **12**
- a) Illustrate with a flow chart, the manufacturing process of polyurethane fibres.
 - b) Differentiate between acrylic and modacrylic fibres on physical and chemical properties. (04 points)
 - c) Justify using physical and chemical properties any four and uses of Nylon 6 fibers.
 - d) Justify the purpose of using additives during the manufacturing of acetate rayon fibres.
 - e) Describe with a neat labelled sketch, the process of polymer solidification for wet spinning technique.

- 5. Attempt any TWO of the following:** **12**
- a) Compare the effect of spinning speed on the fibre structure formation of LOY, MOY, POY, HOY, FDY by melt spinning technique.
 - b) Justify with a neat process flow chart, the functions of various additives used in the manufacturing of Lyocell fibres.
 - c) Demonstrate with a neat flow chart, the relevant spinning parameters for PET by melt spinning techniques.
- 6. Attempt any TWO of the following:** **12**
- a) Justify the selection of additives and modifications in manufacturing process for developing low pilling and flame retardant variant of Nylon 66.
 - b) Elaborate and justify the common array used in the manufacturing of modified acrylic fibres to make it cationic and anionic dyeable.
 - c) Elaborate the different precursors used in the manufacturing of carbon fibres. Also explain the conditions employed during the manufacturing of same.
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