Instructions:
1. Attempt six questions of which Q1 is compulsory
2. Answer each next question on new page
3. Figures to the right indicate full marks
4. Illustrate your answers with sketches and flow charts wherever necessary
5. Use of nonprogrammable electronic pocket calculators permitted
6. Mobile and any other communication devices are not allowed in the exam, hall.
7. Assume suitable data wherever necessary

Q1 a. Discuss the physical and chemical properties of cotton and silk. 10
   b. Discuss the tensile characteristics of different natural and manmade fibers. 10

Q2 a. Discuss the manufacture of nylon fibers with a neat diagram. 08
   b. Discuss the manufacture of polyester fibers by TPA route. 08

Q3 a. Describe the fine structure of silk. 08
   b. Discuss amorphous and crystalline properties of polyester using two phase models. 08

Q4 a. Discuss X ray diffraction technique for elucidating structure of textile fibers. 08
   b. Discuss Scanning Electron Microscopy (SEM) technique for elucidating morphology of textile fibers. 08

Q5 a. Discuss the molecular orientation in textile fibers using birefringence technique. 08
   b. Discuss the zwitterion structure in wool fibers in relation to isoelectric point of the protein molecule. 08

Q6 a. Discuss the thermal properties of polyester with respect to glass transition and melting using Differential Scanning Calorimetry (DSC). 08
   b. Discuss hydrophilic and hydrophobic properties of textile fibers in relation to the molecular structure. 08

Q7 a. Discuss the electro-static properties of various textile fibers. 08
   b. Describe the uses of conducting fibers. 08

Q8 a. Discuss the frictional properties of cotton fibers. 08
   b. Write a note on the characterization of polyester using FTIR technique. 08