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18ST71

Seventh Semester B. Tech. Degree Examination, Feb./Mar. 2022
Structure and Properties of Silk

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Draw the physical structure of silk filament and give the percentage of fibroin and sercin in silk filament and explain the differences in structure of fibroin and sericin. **(10 Marks)**

b. Write a concized note on various amino acids present in different varieties of silk and explain the effect of composition of amino acid on properties of silk. **(10 Marks)**

OR

2 a. Draw cross sectional view of different varieties of silk and explain how cross sectional view makes silk as one of most lustrous fibre. **(10 Marks)**

b. Give density and moisture region of different varieties of silk and draw polypeptide chain of fibroin molecule. **(10 Marks)**

Module-2

3 Explain how fine structural details of silk fibres are determined using X-rays and draw WAXS spectra of different verities of silk. **(20 Marks)**

OR

4 a. Explain how chemical structure of silk is analysed using IRS and draw IR spectra of different verities of silk. **(15 Marks)**

b. Explain Crystalline structure of silk. **(05 Marks)**

Module-3

5 a. Give tensile strength, elongation at break and toughness values of mulberry silk and compare the same with Nylon and Kevlar fibres. **(10 Marks)**

b. With the help of graph explain the effect of denier of silk on its tenacity. **(10 Marks)**

OR

6 a. Write an elaborate note on stress/strain characteristics of different varieties silk fibre. **(10 Marks)**

b. Briefly explain Visco-elastic behavior of silk fibre. **(10 Marks)**

Module-4

7 a. With the help of graphs, explain the effect of temperature on storage and loss modulus of mulberry and Tasar silk fibre. **(10 Marks)**

b. Explain how DTA and TGA are used for thermal characterization of silk fibre. **(10 Marks)**

OR

8   a.   Explain different types of spider silk, draw the diagram of drag line silk produced by spiders.   **(10 Marks)**

       b.   Explain aminoacid composition, property and applications of spider silk.   **(10 Marks)**

Module-5

9   a.   Explain the degumming of silk using enzymes.   **(10 Marks)**

       b.   Explain how silk fibres are dyed using reactive dyes and give chemical structure of reactive dyes for silk dyeing.   **(10 Marks)**

OR

10   a.   Explain various specialty finishes used for silk fabrics.   **(10 Marks)**

       b.   Explain how crease resist an finishes are applied on silk and show the mechanism of crease resistant finishes.   **(10 Marks)**

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