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Total No. of Printed Pages: 1

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M Tech Textile Engineering (Semester – 1st)

PHYSICAL PROPERTIES OF FIBRES

Subject Code: MTEXD1122

Paper ID: [22191808]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It carries 16 marks. It consists of 4 questions of 4 marks each.
2. Section B consist of 4 questions of 8 marks each. The student has to attempt any 3 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(4 marks each)

- Q1. How IR spectroscopy is used in identification of chemical structure of a fibre.
- Q2. Explain the general theory of fibre friction with supporting examples.
- Q3. Derive a relationship $S_v = S_i + S_A + S_A S_l$ in relation to swelling of a fibre detailing various notations used.
- Q4. What are thermal Transitions? State their importance.

Section – B

(8 marks each)

- Q5. Discuss the dielectric properties in reference to textile fibre characteristics..
- Q6. State the importance of Fibre Birefringence. How is it determined?
- Q7. Interpret the Model Theory to have information about the Visco-Elastic nature of fibres.
- Q8. Why fibres exhibits Absorption-Desorption hysteresis? Discuss this mechanism at molecular level.

Section – C

(10 marks each)

- Q9. With the help of mathematical treatment, discuss the Dynamic Mechanical Analysis. Also define loss tangent and loss modulus.
- Q10. Derive Pierce theory of water absorption mentioning its basic assumptions.
- Q11. Explain the phenomenon of static charge generation in textile materials with relevant theoretical support.