Roll No……..….. **Total No. of Printed Pages: 1**

Total No. of Questions: [11]

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 $Sv= S_I+ S_A+S_AS_I$ 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.