

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- IVth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 142802****Date: 25/05/2012****Subject Name: Fibre Physics****Time: 10:30 am – 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Answer the following OBJECTIVE questions: **07**

- i. Define “Degree of orientation”.
- ii. State the properties imparted due to the amorphous content of fibre.
- iii. The ease of extensibility of a specimen is characterized by _____ term.
- iv. Show the formation of ester link.
- v. Differentiate macro and micro structure of a fibre.
- vi. Give the class of polyester fibre.
- vii. What is meant by birefringence?

(b) Elucidate the micro structure of cotton fibre in detail. **07**

Q.2 (a) Describe the technical aspects involved with formation of salt linkages and cross linkages using suitable examples. **07**

(b) Explain about the effect of orientation on mechanical properties of fibres. **07**

OR

(b) Discuss the importance of stress – strain curves of fibres to demonstrate their tensile properties with suitable parameters involved. **07**

Q.3 (a) Elucidate importance of birefringence value derived from refractive index of a fibre to understand optical behavior of fibres. **07**

(b) Introduce fibre friction with its technological effects in connection to fibre physics. **07**

OR

Q.3 (a) Give the technical significance of swelling. Discuss the detailed measurement of swelling effect in different directions. **07**

(b) Derive the relation between moisture regain and moisture content of a fibre using the equilibrium approach. **07**

Q.4 (a) Explain the macro structure and polymer system of silk fibre in detail. **07**

- (b) Discuss the following fibre forming requirements in depth: **07**
- i. High melting point
 - ii. Length
 - iii. Hydrophilic properties

OR

- Q.4** (a) Enlist the methods of investigation of fibre structure. Explain about Reflection electron microscope with neat sketch. **07**
- (b) Explain the following terms in connection to tensile properties of fibres: **07**
- i. Initial modulus
 - ii. Work factor
 - iii. Yield point

- Q.5** (a) Expand DFE to its full form. Explain in detail about felting phenomenon of wool fibre showing the effect. **07**
- (b) Enumerate the detailed morphology of Nylon fibres along with various properties of it. **07**

OR

- Q.5** (a) Derive the relation between dielectric constant and resistance of a material to demonstrate its dielectric properties. **07**
- (b) Explain about primary and secondary creep in detail. **07**
