Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY
B.E. SEMESTER-IV EXAMINATION SUMMER-2015

Subject code: 142802 **Date: 01/06/2015**
Subject Name: Fiber Physics
Time: 10.30am-01.00pm **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**

1. Minimum distance required for formation of hydrogen bond is _____.
2. Name any two properties affected by amorphous content of a fiber.
3. What is meant by ‘ relative humidity’
4. Wright definition of degree of orientation.
5. Moisture has direct impact on electrical properties of fiber. TRUE / FALSE
6. _____ layer of wool fiber is responsible of its crimp.
7. Melting point PET fiber is _____ .

(b) Discuss the fine structure of wool fiber in detail. **07**

Q.2 **(a)** Show and explain stress – strain curves of various fibers to understand their tensile behavior. **07**

(b) Describe in detail about salt linkages and cross links as inter molecular forces in fiber polymer system. **07**

OR

(b) Enumerate various structural changes taking place in fibers due to heating. **07**

Q.3 **(a)** Define ‘fiber friction’. Describe different methods for its measurement with some experimental results. **07**

(b) Mention the effects of polarization on electrical properties of fibers. Also write in detail about electrolytic effect on fibers. **07**

OR

Q.3 **(a)** Discuss the following for Nylon fibers: **07**

(i) Polymer system
(ii) Physical properties
(iii) Cross sectional views

(b) Discuss various factors influencing tensile properties of fibers with appropriate examples. **07**

Q.4 **(a)** Elucidate a vast essay on ‘melting’ of fibers. **07**

(b) Define ‘bi-refringence’. Co-relate it with orientation to explain the optical behavior of fibers. **07**

OR

Q.4 **(a)** Describe the following as requirements of fiber formation: **07**

(i) Chemical resistance
(ii) Linearity
(iii) Hydrophilicity

	(b)	Show the effect of RH on regain of various fibers. Compare and discuss the same.	**07**
Q.5	**(a)**	Define and discuss the concept of ‘ultimate failure‘of regenerated fibers.	**07**
	(b)	Discuss in brief on NMR spectroscopy and IR spectroscopy	**07**

OR

Q.5	**(a)**	Depict shish-kebab structure and Fringed Fibrilles structure in short	**07**
	(b)	Elucidate each term in detail: (i) Initial modulus (ii) Fiber friction (iii) Electrical resistance (iv) Fiber density	**07**

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