Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 142802 Date: 20-06-2014

Subject Name: Fiber 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.	Name any two properties affected by crystalline content of fibres.	
	ii.	Define "Fibre Physics".	
	iii.	What is meant by absolute humidity?	
	iv.	Write definition of "Degree of Order".	
	v.	Yield point and work of rupture are the quantities associated with ____ properties of fibres.	
	vi.	Luster is related to the optical properties of fibres.	
	vii.	Silk has prominent identifiable fine structure. True/False.	
	(b)	Explain the following terms in detail: 1. Work of Rupture 2. Yield Point 3. Initial Modulus	**07**
Q.2	**(a)**	Draw the sketch for fine structure of cotton fibres. Discuss each part in depth.	**07**
	(b)	Discuss various factors influencing tensile properties of fibres with suitable examples.	**07**
		OR	
	(b)	State various properties of ilk fibre in connection to its structure.	**07**
Q.3	**(a)**	Write a detailed note on "Hydrogen bonds".	**07**
	(b)	Discuss the requirement of "orientation" and "melting point" as true requisites for forming fibres.	**07**
		OR	
Q.3	**(a)**	Explain the concept of extension and recovery of rayon fibres in context to their mechanical properties.	**07**
	(b)	Show the relation of density with refractive index and birefringence. Also show the equations to exemplify the same.	**07**
Q.4	**(a)**	Enlist various factors affecting electrical properties of fibres. Discuss all in detail.	**07**
	(b)	Explain about X-ray diffraction to identify the structure of fibre.	**07**
		OR	
Q.4	**(a)**	Describe about Scanning Electron Microscope in detail. (Neat diagram is required)	**07**
	(b)	Enlist different structures of fibres describes by various researchers. Explain any one in detail.	**07**
Q.5	**(a)**	State various physical and chemical properties of polyester fibres. Also discuss about its polymer system.	**07**
	(b)	What is swelling? Give definitions for different types of swelling with their measurement.	**07**
		OR	
Q.5	**(a)**	Define 'regain' and 'humidity'. How can these be measured? Show their relation with proper explanation and example.	**07**
	(b)	Give the thermal behavior of different textile fibres in brief with suitable examples.	**07**

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