Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER • 2014

Subject Code: 142802 Date: 29-12-2014

Subject Name: Fiber Physics

Time: 02:30 pm - 05:00 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.	$M = \frac{x}{1+\left(\frac{R}{100}\right)}$, where x = _____.	
	ii.	The category of fibres which mostly have circular cross section is _____.	
	iii.	Heat of wetting is better known as _____.	
	iv.	Specific stress = _____/denier.	
	v.	Fibres can be easily dyed if they contain high amount of crystalline content. True/False	
	vi.	Lengthwise swelling taking place in fibre is known as _____.	
	vii.	Name any fibre containing cross links in its structure.	
	(b)	Justify numerous properties of cotton fibres with regards its structure.	**07**
Q.2	**(a)**	Discuss the significance of hydrophillicity and tacticity for fibre forming polymers.	**07**
	(b)	Demonstrate the phenomenon of melting and multiple melting.	**07**
		OR	
	(b)	Depict about swelling of fibres. Describe various factors affecting the same.	**07**
Q.3	**(a)**	Depict about gross structure of wool with detailed description.	**07**
	(b)	What is intrapolymer bonding? Discuss on ester and hydroxyl groups of bonding.	**07**
		OR	
Q.3	**(a)**	Diagram and interpret the stress-strain curves of all natural and synthetic fibres.	**07**
	(b)	Bring out a discussion on ultimate failure of fibres with suitable illustrations.	**07**
Q.4	**(a)**	Introduce static electricity influencing physical properties of fibres.	**07**
	(b)	Discuss the technical aspects of X-ray diffraction method in brief.	**07**
		OR	
Q.4	**(a)**	Bring out a study of evolution of fibre structure by different researchers.	**07**
	(b)	Justify the relation of birefringence with the orientation.	**07**
Q.5	**(a)**	Describe some measurement methods for fibre friction.	**07**
	(b)	Write a note on various properties of high performance fibres.	**07**
		OR	
Q.5	**(a)**	Introduce fibre density. Correlate the same with that of degree of order.	**07**
	(b)	Explain about the following terms with suitable illustrations: i. Refractive index ii. Specific heat of fibres iii. Initial modulus	**07**

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