Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 172905 **Date:16/12/2015**

Subject Name: Fibre Science & Elements of Textile Structure

Time: 10:30am to 1:00pm **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)**	With the help of neat sketches, explain any one method used in investigating structure of fibres.	**07**
	(b)	Derive the equations of Pierce's geometry of plain woven fabric for the general case where "neither of the yarn is straight nor it is jammed".	**07**
Q.2	**(a)**	Calculate: a. Distance between yarn centre & yarn surface at corners. b. Distance between yarn centre & yarn surface at centre in case of Hexagonal Close packing for layer number 7th.	**07**
	(b)	Which are the parameters to characterize the migration?	**07**
		OR	
	(b)	Hamilton geometry gave the following data: i. Major diameter = 300μ ii. Minor diameter = 220 μ iii. Ne = 20 Tex iv. Fibre specific volume = 0.7 cm^3/gm Estimate Ø.	**07**
Q.3	**(a)**	Explain in detail the Zonal distribution for individual fibres presented by Morton.	**10**
	(b)	Define: i. Twist factor ii. Ideal migration.	**04**
		OR	
Q.3	**(a)**	Derive: $\tan\alpha = 0.0112\ V_y^{1/2}\ \tau$.	**10**
	(b)	Discuss about Disturbing factors in ideal yarn structure.	**04**
Q.4	**(a)**	Discuss the order, orientation and extent in fibres.	**07**
	(b)	Discuss the quantitative theories for moisture absorption.	**07**
		OR	
Q.4	**(a)**	Discuss the experimental methods used to determine water retention in fibres.	**07**
	(b)	Discuss in brief the theories related to mechanical properties of textiles.	**07**
Q.5	**(a)**	Discuss the Walen's method of crimp measurement using load elongation curve.	**07**
	(b)	Derive the equations related to fabric weight.	**07**
		OR	
Q.5	**(a)**	Derive all the necessary equation to calculate fabric cover.	**08**
	(b)	What is the difference between fabric porosity and permeability? Derive an equation to find Air space in yarn (Yarn air space).	**06**

****