

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –Ist SEMESTER–EXAMINATION – JULY- 2012****Subject code: 712501N****Date: 05/07/2012****Subject Name: Theory of Textile Structure I****Time: 2:30 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		Assuming constant value of Poisson Ratio σ_y , derive equation to predict filament strain ϵ_f for large value of ϵ_y . How the same will be modified if the σ_y is incorporated?	14
Q.2	(a)	Calculate following	07
	1.	150/75/200 Polyester filament yarn has a packing factor of 0.90. The yarn is subjected to a strain up to 15%. Assuming coaxial helical geometry and constant volume deformation, will the yarn be able to sustain the strain if the filament breaking strain is 13.0%?	
	2.	The breaking load of a multifilament acrylic yarn (155/76/0) is 410 g. What will be the tenacity in gpd?	
	(b)	Write a short note on different ways in which fiber packing occurs in yarns.	07
		OR	
	(b)	What are the limitations of Platt's low strain model? Also draw a graph of relative filament strain v/s radial position for different twist angles.	07
Q.3	(a)	Explain fundamental structural features of yarn. How fibre, yarn and fabric structure and properties are interrelated?	07
	(b)	Write in short on various structural features of OE spun yarn.	07
		OR	
Q.3	(a)	How yarn diameter can be worked out using microscope with projector and cross wire? What is Schwarz's constant? Why it is accounted?	07
	(b)	Write in short on various structural features of air jet spun yarn.	07
Q.4	(a)	With the help of theoretical method derive an equation to find out yarn diameter for filament yarn.	07
	(b)	For ideal and perfect migration, prove that RMS deviation (D) is 0.3.	07
		OR	
Q.4		State and define various migration parameters along with expressions. Explain fully the migration analysis as carried out by Riding using statistical correlogram approach, and interpret.	14
Q.5		The stress – strain curve for the acetate yarn is defined by $y = a + b\epsilon_f$. Derive the expression to predict the yarn tenacity in terms of surface – twist angle α . Define α .	14
		OR	
Q.5		Through traditional and qualitative approaches, discuss extension and breakage behavior for spun yarns.	14
