GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

	Sı	ubject code: 1722502 Date: 09/07/201	Date: 09/07/2012					
	Sı	bject Name: Theory of varn manufacturing						
	Ti	$\operatorname{Total} \operatorname{Marks}: 7$	Total Marks: 70					
	In	structions.	v					
	11							
		1. Attempt all questions.						
		2. Make suitable assumptions wherever necessary.						
0.1		3. Figures to the right indicate full marks.						
Q.1	(a)	With neat sketch explain forces involved in ring, rotor and friction spinning. Also compare	07					
	(b)	Define and discuss	07					
	(U)	(i) "bipartite structure" of rotor varn	07					
		(i) Fibre extent and orientation						
		(iii) Spinning in coefficient						
Q.2	(a)	List out the factor which affects twist density of yarn in ring frame spinning zone.	07					
	(b)	Discuss different types of fibre feed with merit and demerits in OE friction spinning system.	07					
		OR						
	(b)	What is the significance of fibre acceleration behind top comb in comber?	07					
Q.3	(a)	With neat sketch explain fibre deposition and layer formation in rotor groove.	07					
	(b)	Explain in short "theory of drafting" by Foster.	07					
~ ~		OR						
Q.3	(a)	Elaborately discuss different principle involved in making fascinated yarn.	07					
	(D)	Calculate maximum radius of balloon from following.	07					
		Varn count 50s						
		Angular traveler speed $= 1600$ rad/sec						
		Ring diameter – 6.7 cm						
		Height of balloon – 22cm						
Q.4	(a)	What is the role of fibre friction field to select draft in drafting in draw frame?	07					
	(b)	Write a note on ring spinning new phenomenon – rotating ring.	07					
		OR						
Q.4	(a)	Explain	07					
		(i) Coriolis force						
		(ii) Effect of balloon height on balloon radius						
0.4	(L)	(11) Difference between thread shape and balloon in ring frame system	07					
Q.4	(D)	Derive an equation of vern tension at any redius 'r'	07					
Q.5	(a) (b)	Derive equation for traveler speed						
	(0)	Calculate the traveler speed at start and end of the doff from following						
		Spindle speed – 17000 r.p.m						
		T.P.I. – 20						
		Package diameter at start -0.7 inch						
		Package diameter at doff – 1.7 inch						
		OR						
Q.5	(a)	Derive the formula for winding tension considering traveler mass, traveler speed, ring diameter	07					
		and ring traveler friction analysed by Krause.	~ =					
	(b)	Calculate dratting force required to draft the material, if the fibre length at front roller of draw	07					
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Fibre length in cm	6	5.9	5.8	5.7	5.6	total
Fibre flux	12	15	10	8	5	50
0' 1 6'1	1.1.1	1.0	1.0			

Single fibre withdrawal force – 1.3gm No. of fibres entering from back roller – 5500 Total draft - 15
