GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER II • EXAMINATION – SUMMER - 2017

Subject Code: 2722502 Subject Name: Theory of V

Date:29/05/2017

Subject Name: Theory of Yarn Manufacture Time:02:30 PM to 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) Fiber length distribution at front roller of a draw frame is as follows:

Length of fiber	10	9	8	7	6	5	4	3	2	1	Total
in cms (I)											
No. of fibers	12	13	15	9	8	7	7	4	3	1	79
(Frequency)											

If force required to withdrawal single fiber is 1.3 gms and there are 4500 fibers entering from back roller and the draft employed is 21. Calculate the drafting force required to draft the material.

Q.2 (a) Calculate the fiber flux and daft at different stages, number of fiber in sliver and yarn cross section from following data. Fiber length = 34mm, Fiber fineness = 1.55 dtex, Yarn count 30 tex, Sliver linear density = 4 ktex, Opening roller speed = 8500 rpm, Opening roller diameter = 70 mm, Rotor speed = 120000 rpm, Rotor diameter = 36 mm, Yarn withdrawal rate = 200 m/min.

(b) Derive an equation of yarn tension at any radius 'r' 06 OR

	(b)	Derive an equation for traveller speed at ring frame.	06
Q.3	(a)	Discuss the influence of hook direction in sliver and roving structure on fiber orientation and quality of yarn.	07

(b) Discussed process parameters affecting the Air-jet spun yarn properties. 07

OR

- Q.3 (a) Define and derive comber fractionation efficiency.
 (b) Compare yarn structure, yarn appearance and tenacity of ring, rotor and DREF3
 07 spinning system.
- Q.4 (a) What is perfect drafting? Why it is not achieved in conventional draw frame? 07 Explain theory of drafting put forward by foster.
 - (b) Why should one study the behavior of floating fibers during drafting? 07

OR

- Q.4 (a) Derive an equation for carding transfer rate / transfer efficiency.07(b) Discussed various factors affecting cylinder loading in card.07
- Q.5 (a) Discussed influence of cotton properties on the cleaning efficiency in spinning.
 (b) Discussed fiber integration class wise into rotor yarn.
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 07
 07

OR

- Q.5 (a) Explain the fiber deposition and layer formation at rotor groove, also depict 07 different equation when the rotor makes 'N' revolution while the yarn arm makes 'n' revolutions.
 - (b) Discussed various developments in condensed yarns spinning system.

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