

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 1722502**Date: 31-12-2012****Subject Name: Theory of Yarn Manufacturing****Time: 10.30 am – 01.00 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)** Calculate drafting force required to draft the material, if the fibre length at front roller of draw frame is as follows: **07**

Fibre length in cm	5	4	3	2	1	total
Fibre flux	10	15	9	8	2	50

Single fibre withdrawal force – 2gm

No. of fibres entering from back roller – 6000

Total draft - 20

- (b)** How individual and parallel fibre get assembled in form of layers in rotor groove. **07**
- Q.2 (a)** Elaborately discuss fibre landing and accumulation in friction spinning system. **07**
- (b)** Describe the role of fibre pressure field to select draft in draw frame drafting system. **07**

OR

- (b)** What is scratch combing? How it is useful for improving yarn quality? Also derive comber fractionation efficiency equation. **07**
- Q.3 (a)** Elaborately discuss the effect of cylinder loading on hook formation on the cotton card. **07**
- (b)** How coriolis force affect yarn winding in ring frame spinning package. **07**

OR

- Q.3 (a)** Derive the formula for winding tension considering traveler mass, ring diameter and ring traveler friction on ring frame. **07**
- (b)** Explain trailing hook formation mechanism on a card. **07**

- Q.4 (a)** Why rotor yarn has bipartite structure? Explain. **07**
- (b)** Which factors affect the twist per inch of ring frame spinning zone? **07**

OR

- Q.4 (a)** Calculate maximum radius of balloon from following. **07**
Tension in yarn – 25125 dynes
Yarn count – 58s
Angular traveler speed – 2000 rad/sec
Ring diameter – 6.5 cm
Height of balloon – 25 cm

- Q.4 (b)** Why one should study the behavior of floating fibre during drafting? Also derive the equation of drafting force on a draw frame. **07**

- Q.5** (a) Explain the concept of perfect drafting. Why it is not achieved on conventional draw frame? List out the suggestions to achieve it. **07**
- (b) Discuss the role of yarn tension in ring spinning to reduce end breakage rate. **07**
- OR**
- Q.5** (a) Calculate the traveler speed at start and end of the doff from following. **07**
- Spindle speed – 20000 rpm
T.P.I – 18
Package diameter at start – 0.9 inch
Package diameter at doff – 1.5 inch
- (b) Define and derive an equation of yarn air drag force at ring frame. **07**
