

M.TECH. DEGREE EXAMINATIONS: DECEMBER 2009

First Semester

TEXTILE TECHNOLOGY

TTX502: Yarn Formation Mechanics and Structure

Time: Three Hours**Maximum Marks: 100****Answer ALL Questions:-****PART A (10 x 2 = 20 Marks)**

1. Define fibre shape factor.
2. Give the formula for floating fibre %.
3. Define compliance ratio.
4. Find out the hank of cotton component of card sliver fed in a draw frame producing Cotton/PET blend using following details.
Blend ratio: 67% cotton, 33% PET
Number of doubling: 8
Hank of PET sliver fed: 0.16
Number of PET sliver fed: 3
5. What do you mean by integrated composite spinning system?
6. Calculate the doubling in rotor spinning using following details.
Yarn turns/ meter: 600
Rotor diameter: 40mm
7. Define Schwarz's constant (K) for determining twist angle ($\tan \alpha$).
8. Define friction ratio in friction spinning.
9. Define Hairiness Index.
10. Define packing fraction.

PART B (5 x 16 = 80 Marks)

- 11) a) With specific reference to fineness of fibre explain its influence on quality of out put yarn in different spinning system with suitable examples.

(OR)

- b) Explain the fibre extent in different spinning technology.

- 12) a) Explain the dynamics of carding and derive an expression for transfer coefficient for loading and unloading condition of fibre in cylinder.

(OR)

- b) i) With neat sketch explain the ideal drafting theory and explain the law of addition of irregularity. (8)
- ii) Explain the concept of drafting waves and the factors determining the amplitude of drafting wave. (8)
- 13) a) i) Explain how you calculate the yarn twist in friction spinning? (6)
- ii) With neat sketch the forms of self twist yarn and explain the production of different doubler twister self twist yarn. (10)

(OR)

- b) i) Classify faciated yarn and compare the yarn characteristics of MVS and MJS. (3+3)
- ii) With neat sketch explain the principle working of MVS 861. (10)
- 14) a) With the reference of ideal yarn geometry prove that $TPI = TM \sqrt{\text{count}}$.

(OR)

- b) With neat sketch explain the ideal migration behavior of fibre in yarn and prove that ideal migration frequency is $(\frac{1}{4}) \sqrt{3D}$ (8 +8)
- 15) a) i) Explain in detail the prediction of tensile properties in blended yarn. (8)
- ii) Explain the effect of twist on fibre breakage in yarn (8)

(OR)

- b) i) Explain different hairiness measurement techniques (6)
- ii) Explain the influence of fibre properties, ring spinning parameters and yarn parameters on hairiness of yarns. (10)
