2012

YARN FORMATION – IV

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) Roving is used as feedstock in which of the following type open-end spinning machine ?

a) Rotor spinning b) Air-vortex spinning

c) Electrostatic spinning d) Friction spinning.

ii) Opener roller speed (rpm) of rotor spinning is usually ranging from

a) 1000-2000 b) 2500-3500

c) 4000-4500 d) 6500-8000.

iii) Which of the following is the feed roller surface speed (m/min) of a rotor producing a yarn of 40 tex from 4 ktex silver at a rate of 45 m/min ?

a) 0·4 b) 0·45

c) 0·5 d) 0·6.

iv) DREF-II spinning is categorised as

a) vortex spinning

b) false-twisted friction spinning

c) open-end friction spinning

d) false-twisted wrap spinning.

v) In Twilo process of twistless spinning, the parallel fibre

strand is adhered by

a) adhesive fibers like PVA

b) polymers

c) the binding agents

d) fevicol.

vi) Jori yarn is produced by applying principle of

a) self-twist spinning

b) twistless spinning

c) air-jet spinning

d) hollow-spindle wrap spinning.

vii) Self twisted yarn is mainly used in

a) short-staple spinning b) worsted spinning

c) woolen spinning d) waste spinning.

viii) Core-sheath type of yarn is made by

a) DREF-III spinning b) DREF-II spinning

c) Rotor spinning d) self-twist spinning.

ix) Twist imparting potential per unit time is highest for

a) rotor spinning b) jet spinning

c) friction spinning d) wrap spinning.

x) Which of the following relation holds true regarding

yarn strength ?

a) air-jet > friction > rotor

b) rotor > friction > air-jet

c) friction > air-jet > rotor

d) air-jet > rotor > friction.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Prepare a broad classification of unconventional spinning

system along with suitable examples of each group.

3. Distinguish open-end spinning from conventional spinning in context with process mechanism. What are the other synonymous terminologies used to express open end spinning and why ? 3 + 2

4. Discuss the limitations of electrostatic spinning and air-vortex spinning process. Which process is preferred for synthetic fibre processing ? 4 + 1

5. Why Repco spinning machine produce ST yarn with 30 degree phase change instead of 90 degree ?

6. Write short notes on Naval of rotor spinning.

7. Discuss the effect of nozzle speed and main draft on air jet yarn characteristics.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. a) In spite of several advantages of new spinning system ring spinning is widely used in spinning industries. Why ? 5

b) Mention different open-end spinning method with an example of related machines. Discuss in detail the advantages of open-end spinning system. 4 + 6

9. a) Explain co-axial and biaxial rotor and their differences. 6

b) The theoretical twist in rotor spun yarn is not adversely affected due to the change from normal withdrawl to reverse withdrawl inside the rotor — justify your answer with the help of the following data :

Rotor speed = 1,00,000 rpm; Rotor diameter = 60 mm,

Yarn withdrawl speed = 90 m/min.

Also find out the calculated twist in above case and why actual twist is different from this calculated twist. 6 + 3

10. a) Discuss the design feature of feed zone and opening zone of a rotor spinning machine. 6

b) Explain the effect of rotor diameter on rotor revolution as well as power consumption. 6

c) What is self-pumping rotor ? 3

11. a) State the principle of operation of friction spinning. 5

b) Mention the different unit of a friction spinning system and their function. 5

c) What are the different design and adjustment factors influencing yarn properties ? 5

12. a) In air-jet spinning single nozzle or double nozzles are used by different manufacturers — explain which one is more effective for quality yarn formation. 5

b) Describe the tensile, evenness, hairiness, frictional, stiffness and abrasion properties of air-jet spun yarn in relation to ring spun yarn. 10

13. a) Illustrate the similarities and difference between Elite spinning of Suessen and COM-4 spinning of Rieter. 6

b) Describe the principle of MVS yarn. The structure of MVS yarn resembles to ring spun yarn — explain. 6 + 3

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