KUMARAGURU college of technology
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Register Number:……..….

M.TECH DEGREE EXAMINATIONS: JAN 2015

(Regulation 2014)

First Semester

TEXTILE TECHNOLOGY

P14TXT102: Theory of Yarn Formation

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The number of fibres in the cross-section of a 20's N_e cotton yarn would be approximately [K_3]

   a) 85 b) 340

   c) 170 d) 680

2. In a card, the point-to-point action results in carding action on the fibres. However, the back-to-back action results in ------ [K_1]

   a) Stripping action b) Cleaning action

   c) Opening action d) Brushing action

3. Six slivers are doubled together and given three passages on draw frame. The number of doublings is [K_3]

   a) 9 b) 18

   c) 486 d) 216

4. Consider the following statements pertaining to irregularity generated in sliver after drafting. [K_3]

   P The irregularity increases with decrease in draft
   Q. The irregularity increases with increase in short fibre %.
   R The irregularity increases with increase in distance between roller nips.
   S The irregularity increases with increase in unevenness of feed sliver

   Choose the right set of answer from the following

   a) P, Q, R b) Q, R, S

   c) P, R, S d) P, Q, S

5. Match the statement given in Group I to those in Group II and choose the correct combination from amongst the alternatives A, B, C, and D [K_2]

p	Increase in short fibre % would	1	increase wrapper fibres in rotor yarn
Q	Increase in non-circularity of fibre cross section would	2	increase yarn bulk
R	Increase in fibre length would	3	increase yarn hairiness
S	Increase in fibre fineness would	4	Increase spinning limit

a) P-3, Q-2, R-1, S-4 b) P-2, Q-1, R-3, S-4

c) P-1, Q-3, R-4, S-2 d) P-1, Q-4, R-2, S-1

6. Consider the elements in Group I and Group II and choose the correct alternatives from amongst A,B,C and D [K_2]

P	Ring yarn	1	Harsh and compact
Q	Rotor yarn	2	Strong and hairy
R	Air-jet yarn	3	Even and extensible
S	OE-friction yarn	4	Bulky and weak
		5	Strong and even
		6	Even and hairy

a) P-2, Q-3, R-1, S-4 b) P-2, Q-6, R-1, S-6

c) P-4, Q-6, R-2, S-1 d) P-3, Q-2, R-4, S-1

7. In a card, theoretically it is beneficial to have smaller cylinder running at higher rpm because it [K_1]

P Results in saving of space
Q Improves carding action
R Increases carding area
S Improves fibre transfer from licker-in to cylinder

Choose the correct combination from amongst the alternatives A, B, C and D

a) P, Q b) R, S

c) Q, R d) Q, S

8. A chorological sequence on the stages of fibre blending is [K_2]

a) Metering- intermingling- mixing b) Mixing- metering –mixing- intermingling

c) Metering- Mixing- intermingling d) Mixing- Metering- intermingling

9. Which one of the following yarn has higher specific volume? [K_2]

a) Conventional ring yarn b) Condensed ring spun yarn

c) Rotor yarn d) Friction spun yarn

10. The following items consist of two statements, one labelled as the "Assertion (A)" and the other as "Reason (R). You are to examine those two statements carefully and select the answers to these items using the codes given below: [K_2]

Assertion (A): The rotor spun yarn has better uniformity than the ring spun yarn of same count and fibres. The reason is fibre doubling occurs inside the rotor

Reason (R) : In rotor spinning, twisting and winding are separated

a) Both "A"and "R" are individually true

b) "A" is true but "R" is false.

c) "A" is False and "R" is true

d) Both "A" and "R" is false

PART B (10 x 2 = 20 Marks)

11. Define Transfer coefficient of a carding machine. [K_1]

12. What do you mean nep removal efficiency of a carding machine? [K_2]

13. Why combing roller is preferred to roller drafting system in rotor spinning? [K_2]

14. What happens to the noil loss as feed length is increased in forward and backward feed combing machine? [K_2]

15. A 40 mm rotor running at 60,000 rpm is producing a yarn at 100 m/min, Calculate the number of doublings of fibre layers in the rotor. [K_3]

16. On a ring frame the spindle speed is 16,000 rpm. If the yarn twist is 8 turns/cm and Winding-on circumference is 5 cm, find out the traveler rpm. [K_2]

17. A 60.5 tex yarn with an unevenness CV of 10% is produced from 0.5 tex polyester fibre. Find out the index of irregularity of the yarn, accurate to one decimal place. [K_3]

18. The winding speed (difference between bobbin speed and traveller speed) of yarn in a ring frame is 200 rev/min when bobbin diameter is 28 mm. If the bobbin diameter is increased to 35 mm, calculate the winding speed (rev/min). [K_3]

19. 20 slivers of 5 Ktex each are fed to the sliver lap former. The draft applied in the sliver lap former is 1.25. The draft given at the ribbon lap former is 6. Find out the linear density of ribbon lap. Assume 6 sliver laps are fed to the ribbon lap former. [K_3]

20. Find out the number of fibers of 1.5 denier in the cross section of a 3 KTex sliver. [K_1]

PART C (10 x 5 = 50 Marks)

21. Explain the theory of hook formation. [K_3]
22. Explain how the intensity of opening is calculated? [K_2]
23. Discuss about factors affecting drafting force. [K_3]
24. Explain about the limitation of apron drafting. [K_2]
25. Compare air jet twisting and air vortex twisting. [K_3]
26. Illustrate TPI = TM $\sqrt{}$count. [K_4]
27. Explain the open end spinning twisting principle. [K_3]
28. Explain the mechanism of fibre migration. [K_3]
29. Explain about index of blend irregularity and Degree of mixing concepts. [K_3]
30. Explain balloon theory with necessary sketches. [K_3]

PART D (2 x 10 = 20 Marks)

31. Explain with necessary illustration of the idealized helical yarn structure. [K_4]

32. Explain in detail about the packing of fibres in yarn. [K_3]

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