NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF TEXTILE TECHNOLOGY
END OF SEMESTER EXAMINATIONS DECEMBER 2003
YARN TECHNOLOGY TXT 2107
TIME: 2 ½ HOURS

INSTRUCTIONS

Answer **ALL** questions from Section A and **ANY 4** from section B. Section A carries 40 marks and each question in section B carries 20 marks. Allocate 60 minutes to section A and 90 minutes to section B.

SECTION A

Answer **ALL** questions in this section.

1. Define or explain what is meant by the following terms:
    (i)   draft
    (ii)   mechanical draft
    (iii)   actual draft
    (iv)   traveller lag
    (v)   twist multiplier   (5 marks)

2. (a) Compare and constrast the advantages and disadvantages of lap feed and chute feed of material.   (4 marks)

    (b) State functions of the blowroom and briefly discuss how they are achieved.   (6 marks)

    (c) Explain why a perfectly random distribution is difficult to achieve during blending.   (2 marks)

3. (a)   The success of spinning is affected by a number of factors amongst them raw materials etc. Discuss how raw materials affect the spinning process
                                                                  (6 marks)

    (b)   Explain how twist insertion is accomplished in ring spinning.

| 4. | (a) | Define bridging fibres in rotor spun yarns. | (2 marks) |

(b) What problems would result from a damaged aprons in the roving frame.
(2 marks)

(c) What is the technical significance of having an even number of machines between the card and comber? (3 marks)

5. (a) Name two types of tension devices found on a typical cone winding and state how they function. (4 marks)

(b) What are the major functions of winding? Why are different yarn packages employed. (4 marks)

SECTION B

Answer any **THREE** questions in this Section.

1. (a) Discuss the limitations of a card and suggest solutions to over coming them. (5 marks)

(b) What effect do card setting have on car production? Clearly show and explain the steps that should be taken when maintaining card wire.
(15 marks)

2. (a) Show and explain the five(5) common traveller wire sections used.
(5 marks)

(b) Calculate the correct travellor speed, given the following:

(i) spindle speed 8500 rpm
(ii) ring diameter 55mm
(ii) front roller delivery 15m/min
(iv) package circumference 110mm (12 marks)

(c) What are the basic ring designs in popular use? (3 marks)

3. (a) Discuss briefly any three spinning systems available. Your discussion must include their method of consolidation. (5 marks)

(b) What factors affect yarn strength and how do these relate to end breakages? (5 marks)

(c)   For a ring spinning frame running at 18000 rpm and producing a 36 tex yarn. It has twist factor of 30 turns tex $\frac{1}{2}$ cm^{-1}.

Calculate:
(a)   Yarn length produced
(b)   Yarn weight produced in 100 spindles in one hour. (10 marks)

4.   (a)   Discuss the functions of a draw frame. What benefits are derived by having a drawing operation as part of spinning sequence?   (5 marks)

(b)   How is twist inserted at the roving frame. Given the mathematical relation of the flayers and delivery.   (5 marks)

(c)   Given that a drawframe runs at a delivery of 420m/min and has an efficiency of 85% and produces 5.2 kilotex silver.

Calculate: (i)   the production Kg/hr in an 8 hr shift.
    (ii)   silver tex of the draft is 6.   (10 marks)

END OF QUESTION PAPER