



Study Programme	: Bachelor of Technology Honours in Engineering / Bachelor of Industrial Studies Honours
Name of the Examination	: Final Examination
Course Code and Title	: TAX3459- Yarn Manufacture I
Academic Year	: 2021/2022
Date	: 23 rd February 2023
Time	: 1330-1630 hours
Duration	: 3 hours

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of Eight (08) questions in Four (04) pages.
3. Write down your Index Number in all the pages of the answer script.
4. **Answer compulsory question one (Q1) and additional five (05) questions.**
5. Question one (Q1) is compulsory and carries thirty (30) marks.
6. Question two (Q2) to eight (Q8) carry fourteen (14) marks each.
7. Answer for each question should commence on a new page. If a question has many parts, all the parts should be answered in the chronological order under the same question.
8. Write down the answered question numbers in the space given in the answer book.
9. Answers should be in clear handwriting.
10. Do not use red colour pen.

Compulsory question

Q1.

- a) Briefly explain why it is essential to apply high twist for the fibers when producing spun yarns, but low twist for continuous filament yarns. (02 marks)
- b) Yarn thickness is an important factor in choosing yarns for various applications. Briefly explain why the yarn diameter is not used to determine the yarn thickness. (02 marks)
- c) Define "Direct" and "Indirect" yarn numbering systems. (02 marks)
- d) State three (03) advantages of automatic bale pluckers and feeders. (03 marks)
- e) Briefly explain the function of the "Finisher scutcher" in the blow-room process. (03 marks)
- f) Explain why carding requires the stripping and grinding of card cloths. (04 marks)
- g) Why do mechanical and material draft on a carding machine have different values? (04 marks)
- h) Describe the importance of "Roller setting" for the drafting of slivers in the draw frame. (03 marks)
- i) State two (02) main objectives of the combing process. (02 marks)
- j) State three (3) main functions performed by the package building motion of a roving frame. (03 marks)
- k) Explain why it is possible to observe "Spinning triangles" during the roving and ring spinning processes. (02 marks)

-----End of the compulsory question-----

Answer any five (05) questions from the following seven (07) questions.

- Q2.** (a) Briefly explain the ginning process performed by a knife roller gin. (05 marks)

(b) Explain what you mean by "Bale" and briefly describe any two (02) major types of impurities contained in bales. (06 marks)

(c) A skein of 6000 meters of polyester filaments yarn weights 96 grams, calculate its Tex, Decitex and Denier equivalents. (03 marks)

Q3. (a) What do you understand by the term "Blending" in yarn manufacturing? List three (03) objectives of blending. (04 marks)

(b) Describe the three (03) physical properties and characteristics of the fibers that are considered before blending the fibres. (06 marks)

(c) Explain two (02) causes for faulty lap formation during the blow room process. (04 marks)

Q4. (a) Briefly explain the below actions taking place in the carding machine. Use suitable diagrams to support the answer, whenever possible. (06 marks)

- i. Carding
- ii. Stripping
- iii. Doffing

(b) State which parts of the carding machine are involved in performing each of the different actions stated in part (a) of the question Q4. (03 marks)

(c) With the aid of suitable diagrams, briefly explain the functions of the following elements of the revolving flat card feed section. (05 marks)

- i. Lap roller
- ii. Feed dish plate
- iii. Feed roller
- iv. Taker-in roller
- v. Moto knives

- Q5.** (a) State two (2) objectives of each of the following actions performed by the draw frame machine, during yarn spinning.
- i. Doubling
 - ii. Drafting (04 marks)
- (b) Explain how are the doubling and drafting actions performed in the draw frame machine. (06 marks)
- (c) Explain any two (02) main auto-levelling systems used in draw frame machines. (04 marks)
- Q6.** (a) State any two (02) main objectives of the roving process. (02 marks)
- (b) Briefly explain how the twisting and winding actions are performed in a roving frame. (04 marks)
- (c) Compare the drafting systems of draw frame and roving frame. (08 marks)
- Q7.** (a) What are the three (03) main objectives of ring spinning process? (03 marks)
- (b) Draw the material flow path of the ring spinning machine using a simple line diagram and briefly describe the main steps in the ring spinning process. (05 marks)
- (c) Compare the package building motions of a ring spinning machine and a roving frame machine. (06 marks)
- Q8.** (a) Briefly explain what you understand by “Spinning ring” and “Traveller” in ring spinning machines. (02 marks)
- (b) Explain the design features of the spinning rings and the travellers of ring spinning machines. (06 marks)
- (c) With the use of suitable diagrams, briefly explain any two (02) methods that are employed to drive the spindles in ring spinning machines. (06 marks)