

The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Textile and Apparel Technology



Study Programme	: Bachelor of Science Honours in Engineering/ Bachelor of Industrial Studies Honours
Name of the Examination	: Final Examination
Course Code and Title	: TAX6366 Yarn Manufacture II
Academic Year	: 2024/25
Date	: 10 th February 2026
Time	: 0930-1230h
Duration	: 3 hours

General instructions

1. Read all the instructions carefully before answering the questions.
 2. This question paper consists of **Eight (8)** questions in **Four (4)** pages.
 3. Answer the question one (Q1), which is compulsory and five (05) more questions from Q2 to Q8. Question one (Q1) carries 25 marks and questions two (Q2) to eight (Q8) carry fifteen (15) marks each.
 4. Answer for each question should commence from a new page.
 5. This is a Closed Book Test (CBT).
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Compulsory Question

- (Q1) (a) What is the purpose of Wool scouring? (02 marks)
- (b) Briefly describe the action that occurs between each of the following roller pairs in woollen carding. (03 Marks)
- I. Swift and Worker
 - II. Worker and Stripper
 - III. Stripper and Swift
- (c) What is the purpose of the maceration process in waste silk manufacturing? (02 Marks)
- (d) List any two (02) processes that are unique to waste silk spinning but not found in cotton spinning. (02 marks)
- (e) Define "Texturing". (03 marks)

- (f) Why is cooling necessary in the false-twist texturing process? (02 marks)
- (g) What is the main benefit of a "Two-for-One" (TFO) twister? (02 marks)
- (h) State the steps of the production process of Polypropylene film tapes. (03 marks)
- (i) Why is the "Stretching" stage critical in tape manufacturing? (03 Marks)
- (j) State any three (03) primary causes of yarn faults caused during spinning. (03 Marks)

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

- (Q2) (a) State the primary factor that determines whether wool is processed through the woollen system or the worsted system and briefly describe how the appearance of the resulting yarn differs between the two systems. (03 Marks)
- (b) Briefly explain how "Stack or Layer Blending" is performed in a woollen mill and state one (01) reason why the "Fearnought" machine is used after this process. (05 marks)
- (c) In the worsted system, briefly explain why "Back Washing" is carried out on the sliver and why "Gilling" must be performed immediately after it. (05 marks)
- (d) State any two (02) main functions of the worsted combing process. (02 marks)
- (Q3) (a) Briefly explain the technical objective of the "Throwing" process in silk yarn manufacture and state any three (03) property modifications that occur in raw silk during this process. (06 marks)
- (b) Briefly explain the necessity of the 'Degumming' process in silk manufacture and the objective of 'Weighting' the silk fibres afterwards. (04 Marks)
- (c) What is meant by 'wild silk,' and why is it used mainly as a raw material for the spun silk industry rather than for reeling into continuous filaments? (05 Marks)

- (Q4) (a) I. Briefly explain the technical reasons why carding is avoided in the manufacture of line flax spinning. (02 marks)
- II. Briefly describe how a continuous sliver is formed in line flax spinning when the carding process is not utilized. (02 marks)
- (b) Briefly explain why is it necessary to use a "Bale Opener" before jute fibers can be handled satisfactorily. (03 marks)
- (c) Compare the spreading process used in Flax line spinning with that used in Jute spinning. Briefly explain the different primary technical objectives of the spreading operation for each of these fibers. (08 Marks)
- (Q5) (a) Briefly explain why it is technically necessary to convert continuous filaments into staple fibers to produce a "spun" yarn. (03 marks)
- (b) Compare the mechanical action of "Stretch Breaking" process with the "Cutting" process for converting tow to top. State one (01) advantage and one (01) disadvantage for each. (08 marks)
- (c) Define "Draw Texturing" and state two (02) reasons for why Partially Oriented Yarn (POY) is preferred over un-oriented yarn for this process. (04 marks)
- (Q6) (a) Compare the English, Scotch and American systems of wet doubling with respect to their mechanical differences in yarn path and the resulting effects on doubled yarn quality. (06 marks)
- (b) I. Briefly describe the construction of core-spun sewing thread and explain the key mechanical stages involved in its manufacturing process. (06 marks)
- II. Justify why a core-spun thread (with a polyester filament core and a cotton or staple polyester wrap) is often preferred over a 100% staple or 100% filament thread for high-performance garments. (03 marks)

- (Q7) (a) Discuss the primary technical limitations of the ring spinning process that led to the development of modern spinning systems. (04 marks)
- (b) Briefly describe the four (04) principal operations involved in manufacturing yarn using the Rotor spinning technique. Explain why rotor spinning is considered more productive than ring spinning. (06 marks)
- (c) Briefly explain the working principle of "Wrap spinning" and state one (01) of its main advantages. (05 marks)
- (Q8) (a) Why is atmospheric control (humidity and temperature) essential in the processing of fibers and yarns? Briefly explain any three (03) advantages of maintaining correct humidity levels. (08 marks)
- (b) I) Briefly explain how "Fancy yarns" differ from ordinary yarns. (03 marks)
- II) Briefly describe the roles of "Ground threads" and "Effect threads" in fancy yarn construction. (04 marks)