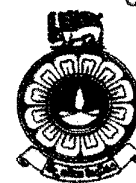


The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Textile and Apparel Technology



069

Study Programme : Bachelor of Science in Engineering/ 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 : 2022/2023
Date : 22nd February 2024
Time : 1330hrs- 1630hrs

General Instructions

1. Read all instructions carefully before answering the questions.
2. This is a Closed Book Test (CBT).
3. This question paper consists of **Eight (8)** questions in **Four (4)** pages.
4. Write down your Index Number in all the pages of answer scripts.
5. Answer the question one (Q1), which is compulsory and five (05) more questions from Q2 to Q8.
6. Question one (Q1) carries thirty (30) marks and questions two (Q2) to eight (Q8) carry fourteen (14) marks each.
7. Answers to 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 answer book.
9. Answers should be in clear hand writing.
10. Do not use red colour pens to write the answers.

Compulsory Question

- (Q1) (a) State six (6) steps involved in ring spun cotton yarn manufacturing. (03 marks)
- (b) Convert following counts to Tex. (02 marks)
- i) 50 Cotton (English)
- ii) 130 Denier
- (c) Write four (4) preliminary actions of machines in blow room. (04 marks)
- (d) State two (2) mechanisms in scutcher to ensure measuring the lap and stopping the machine when the predetermined length of lap was delivered. (02 marks)
- (e) Write four (04) objectives of carding process. (04 marks)
- (f) What is "Doubling" action? (02 marks)
- (g) State three (03) methods of roller weighting done in a draw frame. (03 marks)
- (h) List three (03) types of combers. (03 marks)
- (i) Draw a sketch of flyer and label the following elements;
Flyer top, Spindle top, Guide groove, Pressure arm attachment, Winding Guide and Spindle Shaft (03 marks)
- (j) Write four (04) factors which determine the amount of draft permissible in spinning. (02 marks)
- (k) List four (04) types of cleaning devices used in the spinning machines. (02 marks)

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

- (Q2) (a) Explain the effect of not properly setting the leather rollers in knife roller gin. (06 marks)
- (b) State the purpose of "Ginning" operation in cotton yarn production. (02 marks)
- (c) Write three (03) defects which are directly associated with the ginning process. (03 marks)
- (d) Briefly explain the bailing mechanism of ginned cotton. (03 marks)
- (Q3) (a) Using necessary diagrams, explain the mechanism of "photo-electric cell method" in feed regulating in blow room machineries. (05 marks)
- (b) Write three (03) purposes of grid bars which located under the feed rollers and under the beater in blow room process. (03 marks)
- (c) Briefly explain three (03) precautions which need to be considered when blending or mixing the fibers. (06 marks)
- (Q4) (a) Draw and label three (03) main arrangements of wire points on a card clothing. (06 marks)
- (b) Explain the purpose of grinding rollers in carding machine. (04 marks)
- (c) Briefly describe taker- in dropping and flat strip waste in carding waste. (04 marks)
- (Q5) (a) Mentioning all the assumptions made, calculate the mechanical draft of the carded sliver using following parameters; (06 marks)
- The mass per meter of the lap = 200g
- The material draft = 100
- Waste extraction per meter during drafting process = 16g
- (b) Briefly describe how drafting waves are formed in cotton slivers due to the variations in fiber length. (04 marks)
- (c) Draw 4 over 4 drafting roller arrangement showing material path, labelled drafting zones and speed variation in each pair of rollers. (04 marks)

- (Q6) (a) Briefly describe what tandem carding is. (04 marks)
- (b) Explain the importance of comber preparatory process. (04 marks)
- (c) Describe functions of three (03) main components of central unit of comber. (06 marks)
- (Q7) (a) List three (03) functions of roving frame and state the purpose of each function. (03 marks)
- (b) Describe how do aprons in drafting zone of roving frame facilitate proper drafting. (03 marks)
- (c) Briefly explain the twisting mechanism of roving frame with diagrams. (04 marks)
- (d) Briefly explain why it is required to reduce bobbin rotating speed when the package diameter gets increased. (02 marks)
- (e) Explain why the twist inserted to the roving is called as "Protective twist ". (02 marks)
- (Q8) (a) Briefly describe two (02) factors which affect the amount of twist in final spun yarn. (04 marks)
- (b) i) Using necessary diagrams, briefly explain how balloon formed in ring spinning frame. (02 marks)
- ii) Briefly explain why it is important to control the high balloon formation. (02 marks)
- iii) Using necessary diagram, discuss the mechanism used to control the consequences of high balloon formation in ring spinning machine. (02 marks)
- (c) State two (02) functions of the builder motion. (02 marks)
- (d) Write two (02) functions of traveller in a ring spinning machine. (02 marks)