

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



0031

Study Programme	:	Bachelor of Science Honours in Engineering/Bachelor of Industrial Studies Honours
Name of the Examination	:	Final Examination
Course Code and Title	:	TAX6265 – Advanced Weaving Preparation and Machinery
Academic Year	:	2024/25
Date	:	23 rd February 2026
Time	:	09.30 – 12.30 Hours
Duration	:	3 hours

General instructions

1. Read all the instructions carefully before answering the questions.
 2. This is a closed-book test (CBT).
 3. Write your index number on all the pages of the answer script.
 4. This question paper consists of **EIGHT (08)** questions across Seven (07) pages.
 5. Answer the **QUESTION 01** (a to f), which is **COMPULSORY**, and **ANY FIVE (05)** questions from the Questions 2 to 8. The Question 1 carries 25 marks, and each of the Questions 2 to 8 carries 15 marks.
 6. Do not answer any additional questions.
 7. Start answering each question on a new page.
 8. Write the numbers of the answered questions on the cover page of the answer book.
 9. Write your answers in clear handwriting.
 10. Do not use a red pen for writing your answers.
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COMPULSORY QUESTION**Question 01**

- a) State SIX (06) different classification criteria for winding machines? (04 marks)
- b) State THREE (03) stages of the drawing-in process in weaving? (04 marks)
- c) What is a hank yarn package, and why is a collapsible hexagonal frame used in hank winding? (04 marks)
- d) What is the purpose of looming in the weaving process? (04 marks)
- e) Briefly explain the importance of Quick Style Changing (QSC) in modern weaving machines. (04 marks)
- f) Draw and label the spindle layout of single-sided and double-sided elongated arrangements used in the design of winding machines. (05 marks)

Answer ANY FIVE (05) questions from the following Seven (07) Questions.

Question 02

- a) Explain the difference between yarn knotting and yarn splicing. Discuss their methods, characteristics, and the advantages of splicing over knotting in modern textile processing. (07 marks)
- b) Figure 01 shows side elevation of an automatic winding machine (Autoconer). Explain the step-by-step working procedure of the machine. Discuss how each operational stage is automated to improve yarn quality, and production efficiency. (08 marks)

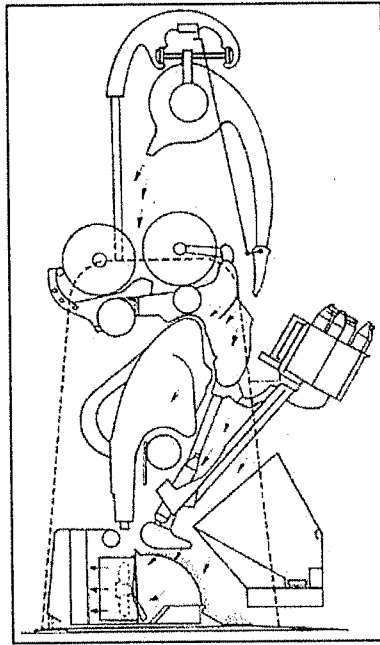


Figure 01.

Question 03

- a) What is a doubler winding? Explain the working principle of a doubler winding machine with reference to the Figure 02. (08 marks)

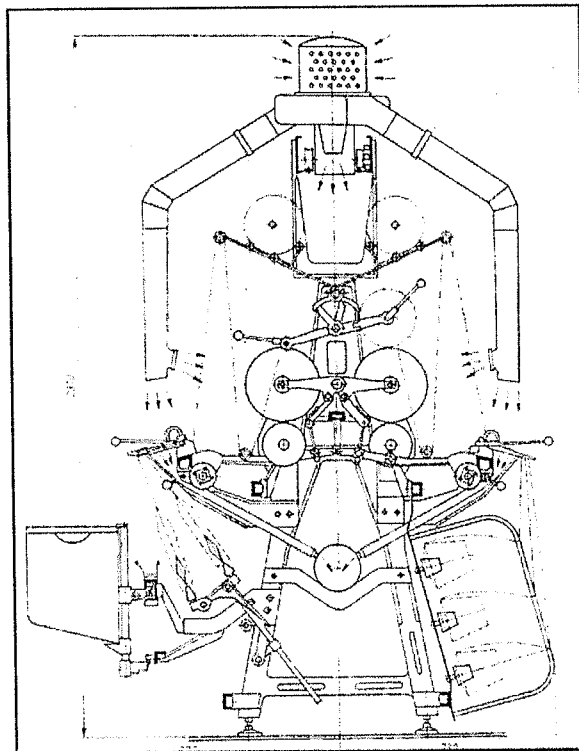


Figure 02.

- b) Explain the structure of a pirn package, and why it is made as a nearly parallel layer package instead of parallel or cross-wound and describe how the chase length and the “bunch” at the beginning of winding help maintain this structure and ensure proper yarn withdrawal during weaving. (07 marks)

Question 04

- a) Figure 03. Shows a rotary dobby mechanism. Explain the working principle of this rotary dobby shedding mechanism. Describe the role of the cam unit, coupler ring, switching key, and reading mechanism in controlling the movement of the heald frames. (07 marks)

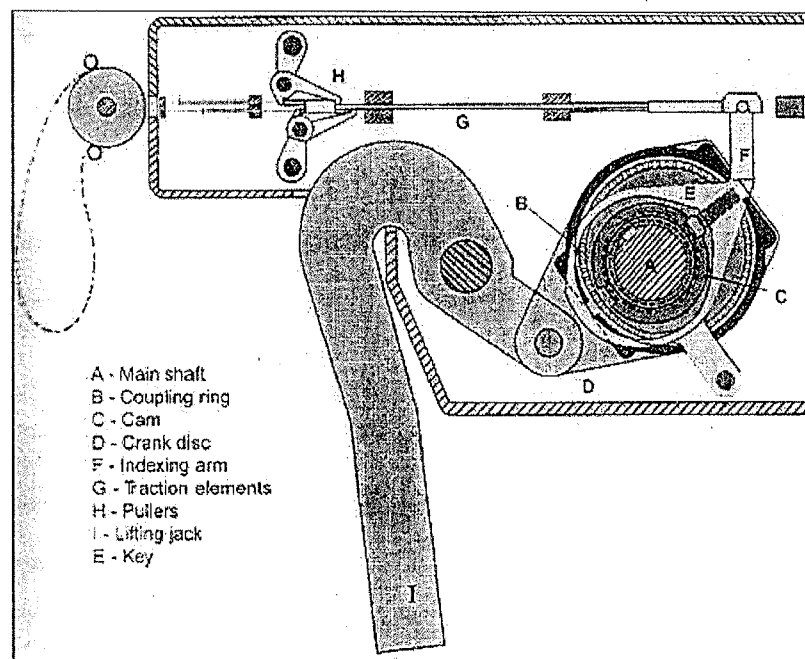


Figure 03.

- b) Compare conventional dobbies and rotary dobbies in terms of their lifting mechanisms, selection mechanisms, and suitability for high-speed weaving.

(08 marks)

Question 05

The Figure 04. Shows a Staubli Jacquard shedding mechanism. Based on this figure, answer the following questions.

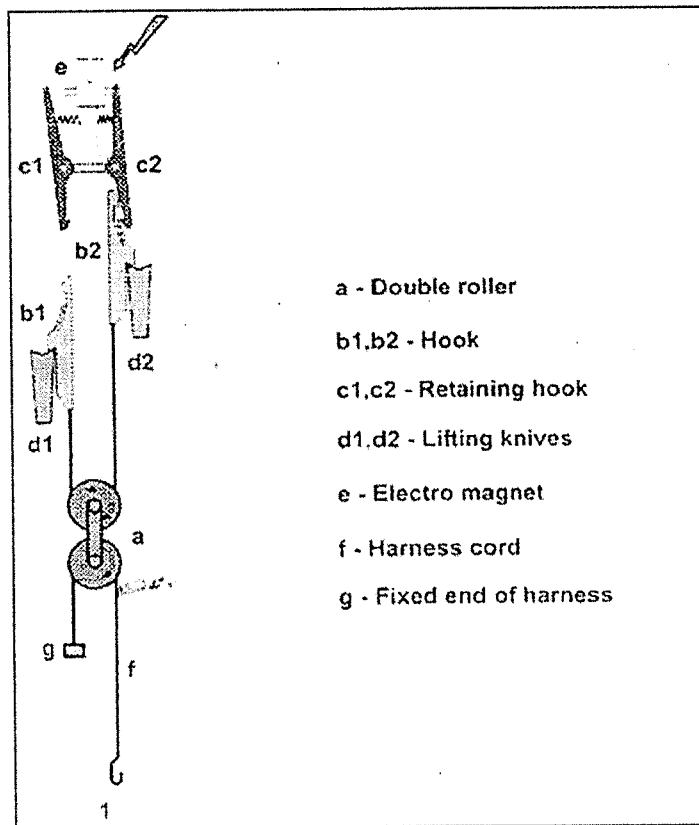


Figure 04.

- a) Explain the working principle of the Staubli electronic Jacquard. Describe how lifting hooks, retaining hooks, and electromagnets interact to control the movement of the harness. (08 marks)
- b) Describe the **sequence of shed formation** in the Staubli Jacquard, explaining how the upper and lower shed positions are achieved according to the pattern stored in the memory. (07 marks)

Question 06

The Figure 05 Shows weft insertion mechanism of the Sulzer Projectile picking system.

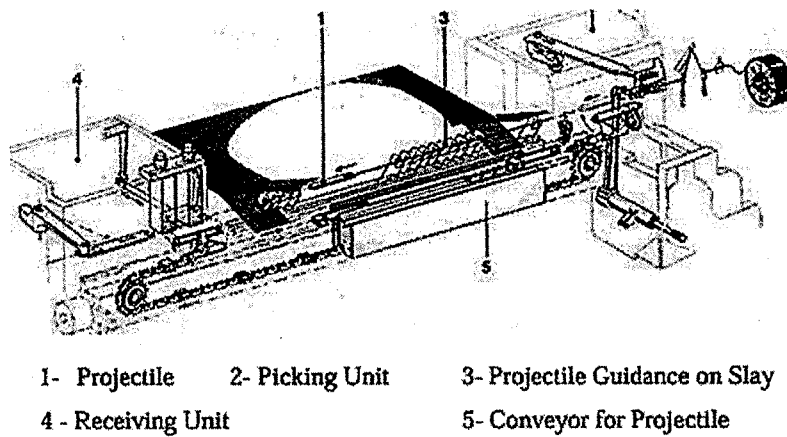


Figure 05.

- a) Explain the path of movement of the projectile in a Sulzer projectile loom and how it facilitates weft insertion. (08 marks)
- b) Briefly explain the purpose of the conveyor in the projectile picking mechanism, and why does its speed differ from the weft insertion speed? (07 marks)

Question 07

- a) Explain how supply pressure, purity, and humidity of compressed air affect the performance of of air-jet looms. (07 marks)
- b) Discuss the advantages and disadvantages of air-jet weaving. (08 marks)

Question 08

- a) Describe the recent on-loom developments in rapier looms. How have these improvements enhanced their efficiency, versatility, and suitability for producing a wide range of fabrics? (07 marks)
- b) Explain the recent on-loom developments common to all types of weaving machines. How have these improvements enhanced automation, quality, and productivity? (08 marks)

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