

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

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Study Programme : Bachelor of Technology Honours in Engineering/
Bachelor of Science Honours in Engineering
Bachelor of Industrial Studies Honours
Name of the Examination : Final Examination
Course Code and Title : **TAX4560 – Woven Fabric Technology**
Academic Year : 2022/2023
Date : 02nd February 2024
Time : 1400hrs- 1700hrs

General Instructions

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

Compulsory Question

- (Q1) (a) List any three (03) structural parameters of a woven fabric. (03 marks)
- (b) State any four (04) stages of warp preparation. (04 marks)
- (c) Illustrate point paper presentation one repeat of 2/1 Z twill weave. (03 marks)
- (d) Explain the two (2) objectives of winding in weaving preparation. (04 marks)
- (e) State any two (2) types of cross-wound packages. (02 marks)
- (f) List the two (02) stages of sectional warping. (02 marks)
- (g) Mention any three (03) methods used to apply size to warp yarn. (03 marks)
- (h) List the three (03) primary motions of weaving. (03 marks)
- (i) State four (04) shuttle-less weft insertion methods. (02 marks)
- (j) List two (02) forms of cone under-pick mechanisms. (02 marks)
- (k) Mention two (02) main types of sley mechanisms. (02 marks)

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

- (Q2) (a) Draw a sectional diagram of weaving loom and label the following weaving machine elements;
- Warp beam, Warp sheet, Back rest, Warp stop motion, Back shed, Heald frames, Reed, Weft yarn, Cloth take-up beam, Cloth beam. (05 marks)
- (b) Calculate the warp crimp percentage and the weft crimp percentage of the fabric sample with the following results of crimp evaluation test; (04 marks)
- Fabric length = 150cm
 - Fabric width = 120 cm
 - Uncrimped length of the warp yarn in the fabric = 161cm
 - Uncrimped length of the weft yarn in the fabric = 132cm
- (c) Calculate the weight in Oz/yd² of the following fabric. (05 marks)
- PE /Cotton (65/35) 40^s x PE /Cotton (65/35) 30^s x 60 inches
- 84 EPI x 68 PPI
- Warp crimp % = 8% and weft crimp % = 10%

- (Q3) (a) State the two (2) basic motions of winding of a yarn package. (02 marks)
- (b) List three (03) methods of facilitating traverse motions of a yarn during winding. (03 marks)
- (c) A winding mechanism has a direct /spindle driven yarn package. The spindle rotates at 5400rpm. The yarn is traversed by a guide reciprocating at a frequency of 675 double traverses per minute. Determine the traverse ratio and the wind. (05 marks)
- (d) Explain any two (02) properties of a pirn package. (04 marks)
- (Q4) (a) Clarify two (02) features of a good warp package. (04 marks)
- (b) Briefly describe two (02) types of warping creels. (06 marks)
- (c) Explain two (02) purposes of warp sizing. (04 marks)
- (Q5) (a) Write down the two (02) Secondary motions of weaving. (02 marks)
- (b) Explain three (03) auxiliary motions with their functions. (06 marks)
- (c) Using diagrams, distinguish between "clear shed "and "irregular shed". (06 marks)
- (Q6) (a) Briefly describe the operational principle of cam shedding. (04 marks)
- (b) State four (04) advantages of Jacquard weaving. (04 marks)
- (c) Mention four (04) limitations of shuttle weft insertion. (04 marks)
- (d) List two (02) functions of a shuttle picking mechanism. (02 marks)
- (Q7) (a) Distinguish between "negative" and "positive" let off motions. (04 marks)
- (b) Briefly explain the purpose of "anti-crack" motion. (03 marks)

- (c) Explain the purpose and functions of weft stop motions in shuttle looms.
(03 marks)
- (d) List four (04) types of warp stop motions.
(04 marks)
- (Q8) (a) Explain the function of the weft feeler mechanism in conventional weaving.
(03 marks)
- (b) Using a suitable illustration, explain the operational principle of a four-link beat up mechanism used in conventional weaving machines. (05 marks)
- (c) Using diagrams, briefly explain three (03) different arrangements of multiple shuttle boxes to achieve weft color patterning in shuttle looms.
(06 marks)