

The Open University of Sri Lanka
Faculty of Engineering Technology

Department of Textile and Apparel Technology



Study Programme	: Bachelor of Science in Engineering Honours Bachelor of Industrial Studies Honours
Name of the Examination	: Final Examination
Course Code and Title	: TAX5648 Fabric Structure and Analysis
Academic Year	: 2024/2025
Date	: 11 th March 2026
Time	: 0930 – 1230 Hours

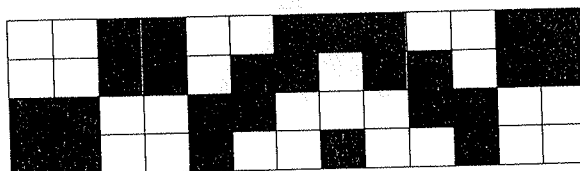
General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of Eight (08) questions in Five (05) pages.
3. Answer five (05) questions, including Question 1, which is a compulsory question.
4. All questions carry equal marks.
5. Answers for each question should commence on a new page.
6. This is a Closed Book Test (CBT).

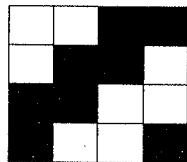
Compulsory Question

- Q1. (a) Draw the drawing-in plan and lifting plan of the weave design given below.
You should use the minimum number of Heald shafts to draw these plans.

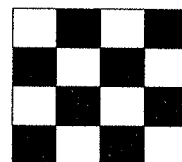
(04 marks)



- (b) Draw two twill weaves of your own, one being warp-faced twill and the other weft-faced twill. (04 marks)
- (c) What are the four different ways by which crepe weaves could be produced? (04 marks)
- (d) Given below are two weave designs that are to be used to weave a double fabric. Give the composite weave design of the double fabric. Please note that the two fabrics need not be stitched together. (04 marks)



Face
Fabric



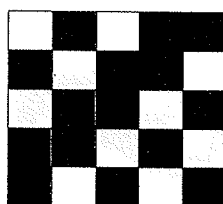
Back
Fabric

- (e) State two (02) differences between Tricot and Raschel knitting processes and machines. (04 marks)

Answer any four (04) questions from the following seven questions

given from Q2. to Q8.

- Q2. (a) Using the set of rules that have been used to develop sateen weave designs, determine the move numbers that can be used to design a sateen weave with weave number 7. (04 marks)
- (b) Develop a weft rib weave design of your choice and give its drawing-in plan and lifting plan. What is the characteristic feature of this design? (06 marks)
- (c) Using the given design as the base, develop a herringbone twill weave. (05 marks)



- (d) Although regular satin/sateen weaves cannot be constructed with certain weave numbers, an irregular satin/sateen weave having some of the characteristics of a regular satin/sateen weave can be constructed. Develop any one such irregular satin/sateen weave. (05 marks)

Q3. (a) Develop a Barleycorn weave of single twill line on a four-end matt structure. (05 marks)

- (b) What are the two (02) types of mock leno weaves that are developed to imitate the leno weave fabrics with open structures? (04 marks)

- (c) Give the point-paper design diagram of a plain-faced Bedford cord weave. (05 marks)

- (d) Give the point-paper design diagram of the wadded Bedford cord weave developed based on the weave design given in Q3(c). (06 marks)

Q4. (a) What are the practical considerations that need to be looked into when designing motifs for extra warp figuring? (06 marks)

- (b) Give the point paper design diagram of a simple extra warp figuring design with a single ground for two extra threads. (08 marks)

- (c) Give three (03) advantages of designing figures with extra warp over designing with extra weft. (06 marks)

Q5. Illustrate the effect of the combination of colour and weave on the following combinations of colour arrangement and weave design.

- (a) Colour arrangement - GGYY on the warp direction and YYGG on the weft direction (where G stands for Green and Y for Yellow)

Weave - Plain weave

(07 marks)

- (b) Colour arrangement - BBBBRRRR on both the warp and the weft directions (where B stands for Blue and R for Red)

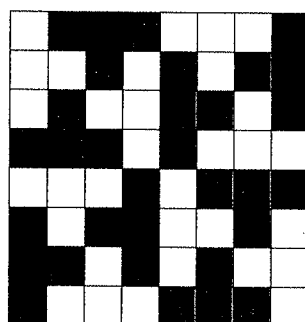
Weave - 2/2 twill weave

(07 marks)

- (c) Colour arrangement - GOOG on both the warp and the weft directions (where G stands for Green and O for Orange)

Weave – See the design given below

(06 marks)



Note that for all the above three questions, you may use any other colours of your convenience.

- Q6. (a) Pile fabrics can be classified into different groups based on the method of production and type of piles. State the different types of pile fabrics based on production method and type of piles. (06 marks)
- (b) Weft pile fabrics, also termed velveteen, have only one method of production. However, based on the structure, they are classified into four groups. What are these four groups? (06 marks)
- (c) With the help of suitable diagrams, briefly explain how corduroy fabrics are produced. (08 marks)
- Q7. (a) With the help of suitable diagrams, briefly explain how interlock and rib structures are developed in weft knitting, including the needle types, needle sets, needle bed arrangement, point paper diagram, etc. (06 Marks)
- (b) What do you understand by overlap and underlap in warp knitting? (04 marks)

- (c) Draw the lapping diagrams for the following guide bar movements in a warp knitting machine. (10 Marks)

i. Guide Bar 1: 1-0/1-2//

Guide Bar 2: 2-3/1-0//

ii. Guide Bar 1: 1-0/0-1//

Guide Bar 2: 1-0/1-2//

Guide Bar 3: 0-4/4-0//

- Q8. (a) Calculate the weight of warp and weft yarn required to produce a fabric woven to the following specifications.

Warp count = 30^s Cotton

Warp length = 2600 yards

Weft count = 40^s Cotton

Width in reed = 94 inches

Ends/inch = 96

Fabric Length = 2500 yards

Picks/inch = 64

Fabric width = 90 inches

No separate selvages are used.

(10 marks)

- (b) A warp-knitted dress material is produced, and in the grey state, it has 24 wales/cm and 36 courses/cm. The run-in is 240 cm for the back bar and 140 cm for the front bar, both bars being fed by 4 tex polyester yarn. Calculate the areal density of this fabric in g/m². (10 marks)