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

056

Study Programme	:	Bachelor of Science Honours in Engineering/ Bachelor of Technology Honours in Engineering/ Bachelor of Industrial Studies Honours
Name of the Examination	:	Final Examination
Course Code and Title	:	**TAX5648 Fabric Structure & Analysis**
Academic Year	:	2022/23
Date	:	22nd February 2024
Time	:	0930-1230hrs
Duration	:	**3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This is a Closed Book Test (CBT).
3. Write down your Index Number on all the pages of answer scripts.
4. This paper consists of two parts, namely Part (A) & Part (B) in 0 pages. Part (A) consists of four (04) questions. This section is compulsory, and the total marks allocated for Part (A) is twenty-five (25).
5. Part (B) consists of Six (06) questions. Answer only five (05) questions. Each question carries fifteen (15) marks. The total marks allocated for Part (B) is seventy-five (75).
6. Answers for each question should commence from a new page. If a question has many parts, all the parts should be answered in chronological order under the same question.
7. Write down the answered question numbers on the cover page of the answer book.
8. Answers should be in clear handwriting.
9. Do not use red-colored pens to write the answers.
10. The conversion of imperial units to metric units, which is necessary for this examination paper is given below.

Imperial Unit	Metric Equivalent
1 inch	2.54 cm
1 yard	0.91 m
1 pound	0.46 kg
1 radian	60 °

Part (A)-Compulsory section. Answer all questions

(Q1.)

a) What are the differences in construction of woven fabrics, knit fabrics and non-woven fabrics? (02 marks)

b) List down any two (02) for each of the yarn parameters and fabric parameters. (02 marks)

c) Briefly explain any two (02) methods to identify the warp and weft yarns in a woven fabric? (02 marks)

(Q2.)

a) Explain the difference in construction between plain, twill and , satin/ sateen weaves. (03 marks)

b) Draw the design, drawing-in plan, and lifting plan of the following weave designs.

i. 2/2 Z twill, stepping one

ii. 2/2 S twill, stepping one

(05 marks)

(Q3.)

a) a)Considering the construction methods, compare and contrast the warp knitted and weft knitted fabrics. (04 marks)

b) Explain the functions of needles and sinkers in knitting machines? (02 marks)

(Q4.)

a) What is the difference between circular knitting and flat knitting machines with considering their machine beds and needle movements? (01 marks)

b) Draw the point paper diagram and yarn path diagram (thread path notation) for

I. 1 x 1 weft knit Rib Structure

II. Weft knit Purl Structure (04 marks)

Please turn over...

Part (B)

Answer only five (05) questions. Each question carries fifteen (15) marks.

(Q5.)

a) Explain the any three (03) factors that influence on the amount of crimp in the fabric (03 marks)

b) An order has been placed to produce a plain-woven fabric for upholstery. The customer requests the grey fabric to be manufactured according to the following specifications:
Areal density of the fabric = 3 ounces/square yard, Warp crimp = 5%, Weft crimp = 10%, Warp cover factor = 15, Weft cover factor = 12, Width of the fabric = 54 inches, Length of the fabric = 600 yards and Selvedges = 25 ends of the same count on either side. Calculate the counts of yarn to be used in warp and weft, determine the total number of ends to be warped on the weaver's beam, and specify the count of the reed required for weaving. (12 marks)

(Q6.)

a) Illustrate a 4/4 matt weave and propose subtle adjustments to enhance its visual appeal without losing the chessboard pattern. (05 marks)

b) Identify the woven structure illustrated in Figure 1 ,2,3,4 and 5.

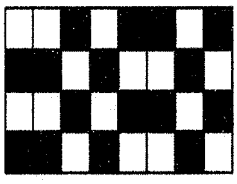

Figure 1

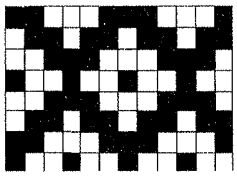

Figure 2

Figure 3

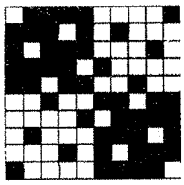

Figure 4

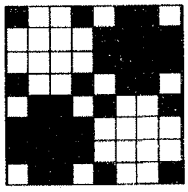

Figure 5

(10 marks)

(Q7.)

a) List down any the four(04) different types for **each of** commercial plain and twill weave fabrics and explain any one (01) property for each of these types, you mentioned. (04 marks)

b) Construct irregular weft rib weaves and draw the corresponding drawing-in and lifting plan (05 marks)

c) A cotton/Polyester blended fabric is woven from 40s warp and 30s weft. The fabric has 72epi and 58ppi, and the warp and weft crimp percentages are 6 and 8 respectively.

I. Estimate fabric weight g/m2. (03 Marks)

II. Calculate the length of warp required to weave 160m of fabric (03 marks)

Please turn over...

(Q8.)

a) What are the primary types of double fabrics, and how are they classified based on their structural construction (07 marks)

b) Draw the point paper notations and yarn path diagrams for main four primary weft knitted structures (08 marks)

(Q9.)

a) Briefly explain any three (03) structural elements of a knitted fabric. (06 marks)

b) Using suitable point paper diagrams, briefly explain how you can change/distort the normal plain knitted structure using the float and tuck stitches. (05 marks)

c) Compare and contrast the two methods of warp knitting, as Tricot and Raschel. (04 marks)

(Q10.)

a) Draw the lapping diagrams for Tricot, Locknit, and Reverse locknit warp knitted structures (06 marks)

Refer to the following given knitted designs in Figures 6, 7, and 8 and answer the questions

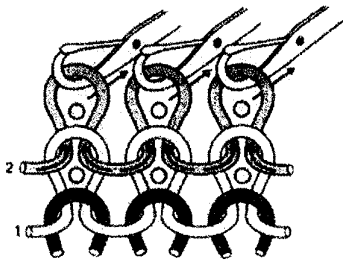

Figure 6

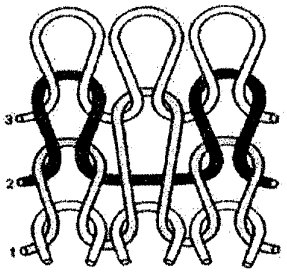

Figure 7

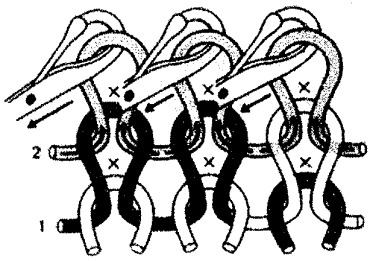

Figure 8

b) Give their point paper diagrams and thread/yarn path notations. (09 marks)

- *The End* -