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

Study Programme	: 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	: 2021/22
Date	: 23rd February 2023
Time	: 0930-1230hrs

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 in all the pages of answer scripts.
4. This paper consists of two parts, namely A & B in 07 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 the chronological order under the same question.
7. Write down the answered question numbers in 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 are necessary in this examination paper are 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

(Q1.)   Refer to the woven structure given below as Figure 1 and answer the questions (a) to (c).
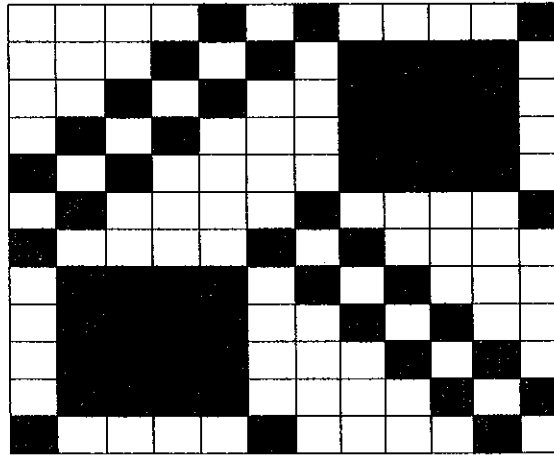

Figure 1

a)   Identify the fancy woven structure illustrated in Figure 1.

(01 mark)

b)   Name the two (02) weaves that have been used in combination to construct the woven structure that you have identified in part (a) of the Q1 question.

(02 marks)

c)   Briefly explain three (03) fabric properties that you can expect from a fabric produced according to the structure given in figure 1(part (a) of Q1 question) and justify the answers giving reasons.

(06 marks)

(Q2.)   Briefly explain one (01) favourable property and one (01) limitation of reversible double woven cloths.

(04 marks)

Please turn over...

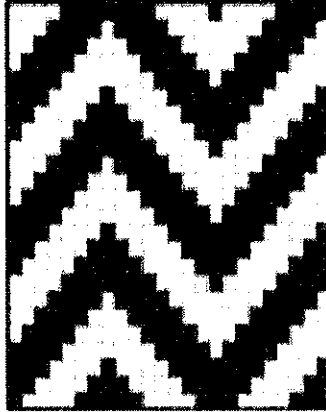**(Q3.)** Refer to the woven design given below as Figure 2 and answer the questions (a) to (c).

Figure 2

a) Identify the woven structure illustrated in Figure 2.

(01 mark)

b) Draw the design repeat of the structure that you identified in part (a) of the question Q2, with considering a suitable repeat size.

(03 marks)

c) Draw the drafting plan and the lifting plan for the above structure given in figure 2 (part (a) of the question Q2).

(04 marks)

(Q4.) Briefly explain two (02) advantages of "Extra warp thread figuring" over "Extra weft thread figuring".

(04 marks)

Please turn over...

(Q5.) The structural parameters of a woven fabric can have a significant impact on its performance and functionality, making it essential to understand and analyse these factors in order to make informed decisions about material selection and use.

a) State two (02) yarn parameters and three (03) fabric parameters that can be identified during the analysis of a woven fabric.

(05 marks)

b) Based on the practical knowledge on analysing the woven fabric samples, briefly explain two (02) steps that you can take to identify the warp direction of a plain-woven fabric sample.

(04 marks)

c) Suppose that you have been given a plain-woven fabric, that has a warp count of 24 Tex and weft count of 36 Tex. The fabric has a weight of 150 g/m² and a thickness of 0.25 mm. Calculate the warp density (EPI) and weft density (PPI) of the fabric.

(06 marks)

(Q6.) The colour and weave effect is a popular technique used in textile design to create visually interesting patterns and textures on woven fabrics.

a) Using the colour and weave effect, develop designs showing vertical stripes, on a 4 x 4 plain base with clearly showing all the steps that are involved.

(03 marks)

b) Briefly examine the need for designs using the colour and weave effect, listing out the merits and demerits with comparison to printing the design.

(05 marks)

c) Develop the weave design that you can obtain from the crepe weave of 8 x 8 repeat given below in Figure 3. Consider that this is coloured on 2 : 2 (The yarn colouring arrangement is 2 x 2).

Please turn over...

	X	X	X				X
		X		X		X	X
	X			X	X		X
X	X	X		X			
			X		X	X	X
X		X	X			X	
X	X		X		X		
X				X	X	X	

Figure 3

(05 marks)

d) Name the colour and weave effect that you obtained in part (c) of this question Q6.

(02 marks)

(Q7.)

a) Briefly state the three (03) methods that can be used to produce a self-stitched woven double fabric.

(03 marks)

b) Name two (02) fabrics that are constructed as double fabrics on the loom, but the output is a single fabric.

(02 marks)

c) Explain the suitability of using the mockleno weave as shirting material to be used as a formal office wear.

(05 marks)

d) Develop an 8 x 8 Huckaback weave using a suitable motif.

(05 marks)

(Q8.)

a) Compare and contrast the plain and interlock knitted structures, considering the appearance of the technical face and back, the aspect of edge curling and the tendency to unravel.

(03 marks)

b) Using suitable diagrams, briefly explain two (02) differences between rib gating and interlock gating.

(04 marks)

c) Briefly describe two (02) ways of practically identifying interlock structures from rib structures.

(04 marks)

d) What are the two (02) parameters by which a weft knitting machine is characterized? Briefly explain each of these parameters.

(04 marks)

(Q9.)

a) A warp knitted dress material is produced, and in the grey state it has 20 wales/cm and 24courses/cm. The run in is 190 cm for the back bar and 114cm for the front bar, both bars being fed by 5 tex polyester yarn. Calculate the area density (GSM) of this fabric in g/m^2.

(06 marks)

b) Briefly explain three (03) properties that you could expect from a warp knitted dress material that is produced according to the fabric specifications; warp density, weft density and area density (GSM).

(06 marks)

c) Briefly explain how tuck stitches are formed in a weft knitting machine.

(03 marks)

(Q10.)

a) Briefly explain the technique of producing a velvet structure.

(05 marks)

Please turn over...

b) Describe three (03) ways in which different variations can be introduced to warp pile fabrics.

(06 marks)

c) As a practice, extra thick ends are added to the Bedford cord Weave when producing a wadded weave structure. Briefly explain the purpose of this practice.

(04 marks)

- *The End* -