The Open University of Sri Lanka

Faculty of Engineering Technology

Department of Textile and Apparel Technology

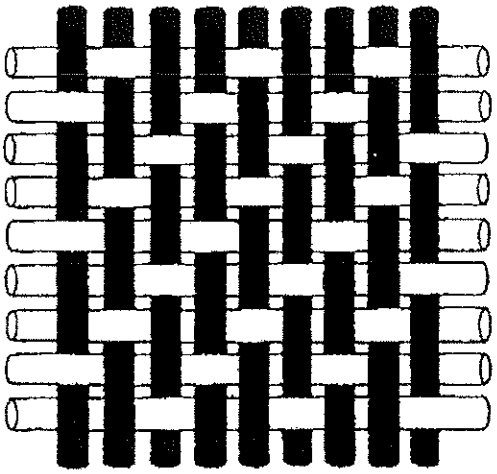
Study Programme	: Bachelor of Industrial Studies Honours
Name of the Examination	: Final Examination
Course Code and Title	**: TAI3536/TTI3236 Fabric Structure and Analysis**
Academic Year	: 2019/2020
Date	: 13th August 2020
Time	: 1330 -1630hrs
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of Eight (8) questions in Five (5) pages.
3. This is a Closed Book Test (CBT).
4. Write down your Index Number in all the pages of answer scripts.
5. Answer the question one (01), which is compulsory and five (5) more questions from question two (02) to question eight (08). Question one (01) carry twenty-five (25) marks and questions two (02) to question eight (08) carry fifteen (15) marks each.
6. Answer 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 answer book.
8. Do not write answers to the additional questions.
9. Answers should be in clear hand writing.
10. Do not use red colour pens to write the answers.

Compulsory question

01. a) Refer to the woven structure given below and answer the questions i) to iii).



i. Draw the point paper representation of a single design repeat of the given woven structure. (04 marks)

ii. Draw the drawing - in plan of the design repeat using minimum number of heald shafts. (03 marks)

iii. Draw the lifting plan of the design repeat. (02 marks)

b) Write two (02) advantages of "Extra warp thread figuring" over "Extra weft thread figuring". (02 marks)

c) State the difference between Tricot warp knitting machine and Raschel warp knitting machine with reference to the angle of fabric withdrawal from the machine. (02 marks)

d) Compare the Tricot and Locknit warp knitted structures with respect to the fabric handle. (04 marks)

e) A fabric has been woven to the following specifications.

Warps/inch	= 50
Wefts/inch	= 80
Warp length	= 124 yards
Width in reed	= 37 inches
Fabric Length	= 120 yards

Fabric width = 35 inches

Calculate the following.

i. Total number of warp yarns in the fabric. (02 marks)

ii. Total length of warp yarns in the fabric. (02 marks)

iii. Total number of weft yarns in the fabric. (02 marks)

iv. Total length of weft yarns in the fabric. (02 marks)

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

02. Draw the point paper representation of the following weaves.

a) Plain weave (02 marks)

b) 2/1twill weave (02 marks)

c) Herringbone twill with ½ twill base (04 marks)

d) 8 end satin with move number 3 (04 marks)

e) 2/2 matt weave (03 marks)

03. a) Name two (02) fabric parameters and three (03) yarn parameters that can be identified during analysis of a woven fabric in order to reproduce the fabric. (05 marks)

b) Briefly explain how you would identify the warp direction of a given woven fabric sample. (05 marks)

c) Provide the steps of identifying a woven fabric structure of a fabric sample using a counting glass and a pin. Assume that the warp direction of the fabric sample has been marked. (05 marks)

04. a) How do you identify a Bedford cord woven fabric considering the appearance? (02 marks)

b) Develop a weave design on your own by combining any irregular weft rib weave and irregular warp rib weave. (05 marks)

c) Develop crepe weave by **superimposing** any two suitable weave types. (08 marks)

05. a) Develop a woven design with two coloured vertical stripes in a plain weave base. (06 marks)

b) Develop 8 x 8 Huckaback weave using a suitable motif. (06 marks)

c) What is the difference between dobby shedding and Jacquard shedding with respect to the control of heald shafts? (03 marks)

06. a) Giving examples, briefly explain how a self-stitched woven double fabric structure could be constructed. (09 marks)

b) Briefly explain the steps involved in constructing a corded velveteen woven structure using point paper representations. (06 marks)

07. a) Compare the **plain** and the **interlock** knitted structures considering the given below aspects. (06 marks)

i. Appearance of technical face and technical back

ii. Edge curling

iii. Ability to unravel a yarn from the course knitted first

b) Draw the point paper representation and thread path notation for the technical face of the below given weft knitted structures. (04 marks)

i. 1 x 1 rib structure

ii. Purl structure

c) With the aid of suitable diagrams, briefly explain the differences between the **rib gating** and the **interlock gating**. (05 marks)

08. a) 4000 meters of a cotton spun yarn weighs 160 grams. Calculate the tex count and the cotton count of the yarn. (04 marks)

b) Find the resultant count of a 2-fold yarn composed of yarns with 30s and 40s count. (05 marks)

c) A dry-relaxed plain knitted cotton fabric is made from 20 tex yarn and has a stitch length of 6mm. Calculate the areal density of the fabric. Use the below details where necessary. (06 marks)

Fabric State (Plain knitted fabric)	K_s	k_c	k_w	k_c/k_w
Dry relaxed	1900	50	38	1.31
Wet relaxed	2160	53	41	1.29
Finished relaxed	2360	56	42.2	1.32

-End of the question paper-