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	**: TAX6455 Fabric Technology**
Academic Year	: 2021/22
Date	: 12th February 2023
Time	: 1330-1630hrs
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 in all the pages of answer scripts.

4. This question paper consists of Six (06) questions in five (05) pages.

5. Answer Five (05) questions only. Each question carries 20 marks

6. Do not write answers to the additional questions.

7. 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.

8. Write down the answered question numbers in the cover page of the answer book.

9. Answers should be in clear handwriting.

10. Do not use red colour pens to write the answers.

(Q1) (a) Briefly explain how following fabric types are produced in the industry and state their purpose/s of manufacturing.

(i) Flocked fabrics   (ii) Laminated fabrics   (iii) Quilted fabrics

(06 marks)

(b) There are four major categories of fabric characteristics that interest to the apparel manufacturer. With concerning their purposes, briefly explain why each of them are important for the manufacturer.

(08 marks)

(c) (i) Visual characteristics of a fabric should be considered by the apparel manufacturer. Briefly explain four (04) colour quality problems considered by them under the visual quality characteristics.

(04 marks)

(ii) Give any three (03) factors that may change the fit of clothing (fit for use).

(02 marks)

(Q2) (a) (i) Change of fabric structure can change the tactile characteristics. Explain this giving three (03) examples.   (06 marks)

(ii) Clothing comfort can be influenced by two factors. Briefly explain this statement giving suitable examples.   (04 marks)

(b) Briefly explain the functions/reasons of using following house hold textiles.

(i)Bed linen   (ii) Wall hangings   (iii)Towelling & wash clothes

(06 marks)

(c) Differentiate the Geo textiles and Geo membranes used in civil engineering earth works and using a suitable sketch, briefly explain how Geo textiles are constructed as tri-axial fabrics.   (04 marks)

(Q3) (a) A student observed following two things about woven fabric samples. Give the reasons for **each** of these observations.   (06 marks)

(i) Crimps of warp and weft yarns in a plain woven fabric are different.

(ii) During the tensile test, a woven fabric sample gets the following shape at its vertical edges.
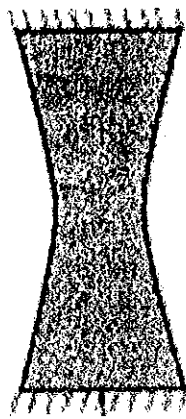
(b) (i) Woven fabric with a higher cloth sett (higher warp and weft densities) show higher tensile strength than fabrics with a lower cloth sett. Give the reason for this behaviour. (02 marks)

(ii) Briefly explain why twill fabrics are more suitable for trousers and jeans than the plain fabrics. (06 marks)

(c) Give the reasons for following observation of woven fabrics.

Surface appearance of warp faced, weft faced and rib (rep) fabrics are different to each other. (06 marks)

(Q4) (a) (i) Briefly explain why twill fabrics are usually softer and having greater wrinkle resistance than plain weave? (04 marks)

(ii) With giving reasons, briefly explain why twill fabrics have higher cloth sets and are more suitable for wind resistance clothes used in cold climates than plain woven fabrics? (04 marks)

(b) Reason out the following behaviors of woven fabrics.

(i) Plain fabrics show lower tearing strength values compared to tensile strength values. (04 marks)

(ii) Warp direction strength of a plain woven sample is higher than that of the weft direction strength although weft and warp has same fibre type and yarn count (04 marks)

(c) Relaxation shrinkage is a common shrinkage type with woven and knitted fabrics. Briefly explain the relaxation shrinkage behaviour of fabrics, using two examples. (04 marks)

(Q5) (a) (i) Using suitable point paper diagram and yarn path diagrams, explain how do you obtain various plain knitted structures with distorted knitted stitches.

(03 marks)

(ii) Draw the yarn path and point paper diagrams for double lacoste (double cross tuck), simple crepe and mock rib plain structures with distort stitches. (06 marks)

(b) Briefly explain the structural difference in full cardigan and half cardigan rib structures using yarn path diagrams and give the fabric properties of each structure. (06 marks)

(c) Using a suitable yarn path diagram, explain how do you produce Swiss double pique structure and state the specific fabric appearance of this fabric.

(05 marks)

(Q6) (a) Using suitable yarn path diagrams, explain the difference between 8-lock and 12-lock interlock structures.

(04 marks)

(b) Compare woven and knitted fabrics considering following factors.

(i) Movement, mobility and elasticity   (ii) Recovery after wrinkling

(04 marks)

(c) (i) Draw the yarn path diagram and calculate the loop length of a double jersey knitted structure given by following point paper diagram, if the number of wales counted between two points on face side of the following structure (visible wales) is 12 and the length of unraveled uncrimped yarn is 15 cm.

X	X	X	●	0	0	●	X	X	●

(04 marks)

(ii) A knitter needs to produce 5000 square meters of full/finished relaxed plain knitted worsted fabric with the density of 192.65 stitches/cm^2.
Calculate the,
(a) required length of yarn considering the wastage of 5% of yarn, during manufacturing.

(b) course and wale density of produced knitted fabric.

Following table gives the Relaxation constants (for metric units).

Fabric State	Parameter			
	ks	kc	kw	kc/kw = R.
Dry relaxed	1900	50	38	1.31
Wet relaxed	2160	53	41	1.29
Finished relaxed	2360	56	42.2	1.32

(08 marks)