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/ TAX6565 Fabric Technology**
Academic Year	: 2020/21
Date	: 18th February 2022
Time	: 1400-1700hrs
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 four (04) 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 textile composite fabrics are produced in the industry.

    (i) Tufted fabrics   (ii) Coated fabrics   (iii) Flocked fabrics

(03 marks)

    (b) Briefly explain why following fabric characteristics are considered as hand characteristics.

    (i) Elongation   (ii) Elasticity   (iii) Drapability

(03 marks)

    (c) (i) Utility characteristics of textiles are two types namely, transmission and transformation. Differentiate these two types and give two (02) examples for each type.   (08 marks)

    (ii) Briefly explain how coefficient of friction, die mouldability and press mouldability are important as product production working characteristics.

(06 marks)

(Q2) (a) (i) Comfort of garment depend on physical properties and characteristics of fabrics. Briefly explain how fabric GSM, fabric thickness and thermal conductivity of fabrics effect on the comfort of garments.

(06 marks)

    (ii) Clothing comfort can be influenced by two factors such as a fabric properties and garment design. Briefly explain this statement giving suitable examples.

(04 marks)

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

    (i) Curtains   (ii) Floor coverings   (iii) Table clothes   (06 marks)

    (c) Explain briefly, why seat covers and seat belt of a car are considered as functional and/or aesthetic (decorative) fabrics.   (04 marks)

(Q3) (a) A student observed following two things about woven fabric samples. Give the reasons for each of these observations.   (04 marks)

    (i) Plain woven fabric sample is easy to tear than twill fabric sample. Assume that both have approximately same in warp and weft setts.

(ii) Warp yarns in a plain woven sample has lower crimps compared to that of a weft yarn.

(b) Draw a suitable diagram to illustrate what will happen to a plain woven fabric sample under the application of tensile load during tensile strength test and reason out this behaviour of the plain woven fabric sample.

(05 marks)

(c) (i) Draw suitable diagrams and explain the structural differences among plain woven fabric, leno fabric and tri-axial woven fabrics. (06 marks)

(ii) Differentiate balance and unbalance plain fabrics and give one example (01) for each case. (05 marks)

(Q4) (a) (i) With giving reasons, compare the tensile strength of twill or satin fabrics and plain woven fabrics? (04 marks)

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

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

(i) Plain fabrics show good abrasion resistance compared to twill fabrics. (04 marks)

(ii) Cotton fabrics shrinks after laundering. (04 marks)

(c) Differentiate power stretch and comfort stretch fabrics and give suitable examples for **each**. (04 marks)

(Q5) (a) (i) How do you differentiae single jersey and double jersey knitted structures with reference to the no. of needle sets and needle beds used in production of them and give suitable examples for **each**. (02 marks)

(ii) Draw the yarn path and point paper diagrams for cross-miss stitch, single lacoste (single cross tuck), birds eye and weft lock knit plain structures with distort stitches. (06 marks)

(b) Differentiate full cardigan and half cardigan rib structures using yarn path diagrams and give the fabric properties of **each** structure. (06 marks)

(c) (i) Using suitable diagrams, explain the difference between rib gating and interlock gating used in weft knitting machines. (03 marks)

   (ii) Draw yarn path diagrams for normal interlock and eight-lock knitted structures. (03 marks)

(Q6) (a) Using suitable diagrams, explain the difference between cam paths in knitting cams used for producing rib structures and interlock structures in conventional knitting machines (04 marks)

(b) (i) Explain the difference between single jersey knitting machine used for plain and purl fabrics production, with considering the types of knitting needles and no. of knitting beds used in these two types.
(02 marks)

   (ii) Give the main difference of the principle related to manufacturing of warp knitted structures and weft knitted structures.
(02 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 18 and the length of unraveled uncrimped yarn is 25 cm.

X	X	X	X	0	0	0	X	X	●

(06 marks)

   (ii) Calculate the required length of yarn to produce 1000 square meters of **full relaxed plain knitted worsted fabric** with an average stitch length of 5mm and also determine the course density and wale density of this fabric. Assume wastage of 5% of yarn, during manufacturing.

   Following constants are given.

   Ks at full relax state =2360 and

   Course density : wale density at dry state=1.32 (06 marks)