THE OPEN UNIVERSITY OF SRI LANKA

BACHELOR OF INDUSTRIAL STUDIES

FINAL EXAMINATION - 2014/2015

TTI3236 FABRIC STRUCTURE AND ANALYSIS

DURATION – THREE HOURS

DATE: 05 SEPTEMBER 2015   TIME: 0930-1230 HOURS

This question paper comprises 09 questions. You are required to

answer a total of 06 questions.

Answer Question 1, which is compulsory and any other five (05)

questions.

Question 1 carries twenty-five (25) marks and Questions 2 to 9 carry

fifteen (15) mark each.

1. (a) What are the possible move numbers for 8 end sateen weave? Explain how you

   obtained the answer.   (4 Marks)

   (b) What do you understand by a point paper diagram?   (2 Marks)

   (c) From the point of view of design diagram, what is the difference between a

   'huckaback' weave and the 'mock leno' weave?   (4 Marks)

   (d) Productivity of fabric with extra-warp figuring is higher than the productivity of

   fabric with extra-weft figuring. Explain why?   (3 Marks)

   (e) What are the different ways of producing cut pile fabrics?   (3 Marks)

   (f) How are tubular woven fabrics produced using the double cloth weaving technique?

   (3 marks)

(g) What are the three (03) functions performed by a sinker during the knitting process?

(3 Marks)

(h) How are purl fabrics different to other weft knitted fabrics? (3 Marks)

2. (i) Develop a herringbone twill weave and give its drawing-in plan and lifting plan.

(8 Marks)

(ii) Develop a combination weave using plain and matt weaves and give their drawing-in plan and lifting plan. (7 Marks)

3. (i) Develop a weave combining matt weave and twill weave. (7 Marks)

(ii) Develop a warp faced complex twill weave of your choice. (8 Marks)

4. (i) Develop an irregular rib weave of your choice. (6 Marks)

(ii) Draw a crepe weave using any of the four techniques of developing crepe weaves. All steps of development must be clearly shown. (6 Marks)

(iii) State the important characteristics of moss crepe fabrics. (3 Marks)

5. (i) Using the colour and weave effect develop the dog's tooth design based on 2/2 twill weave. (6 Marks)

(ii) Illustrate using the colour and weave effects how vertical and horizontal stripes could be developed based on matt weave design. (6 Marks)

(iii) Draw the drawing-in plan of the dog's tooth design you developed in Q5(i).

(3 Marks)

6. (i) What are the different ways by which a double fabric could be stitched?   (5 Marks)

   (ii) Develop a double weave fabric with matt weave in the face fabric and 2/2 twill weave in the back fabric.   (10 Marks)

7. (i) Explain the difference between single jersey structures and double jersey structures.

   (5 Marks)

   (ii) With the help of diagrams explain the difference between the rib gating and interlock gating.   (5 marks)

   (iii) Explain the differences between tricot machine and raschel machine   (5 marks)

8. (i) The chain notation of locknit and sharkskin structures are as follows.

   Locknit

           Front bar –   1 – 0 / 2 – 3

           Back bar -   1 – 2 / 1 – 0

   Sharkskin

           Front bar -   1 – 0 / 1 – 2

           Back bar -   3 – 4 / 1 – 0

   Draw the lapping diagrams of these two structures.   (10 marks)

   (ii) A sharkskin (three-needle) warp knitted shirting is produced. In the grey state, there are 12.6 wales/cm and 30.38 courses/cm. The run-in is 182.9 cm for the back bar and 104.1 cm for the front bar, both bars being fed by 4 tex dull nylon 6.6. Calculate the areal density of this fabric in g/m^2.   (5 marks)

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9. An order has been placed to produce a plain-woven fabric for handkerchief. The customer wants the grey fabric to be produced to the following specifications.

Areal density of the fabric = 2 ounces/square yard

Warp crimp	= 4 %
Weft crimp	= 7 %
Warp cover factor	= 10
Weft cover factor	= 8
Width of the fabric	= 38 inches
Length of the fabric	= 1000 yards
Selvedges	= 20 ends of same count on either side.

Furthermore, it is required that the ends/inch and the picks/inch be the same.

Calculate the counts of yarn to be used in warp and weft and the total number of ends to be warped on the weaver's beam.

Also mention the count of the reed to be used to weave this fabric.

(15 marks)