THE OPEN UNIVERSITY OF SRI LANKA

DEPARTMENT OF TEXTILE AND APPAREL TECHNOLOGY

BACHELOR OF TECHNOLOGY HONOURS IN ENGINEERING/
BACHELOR OF INDUSTRIAL STUDIES HONOURS

FINAL EXAMINATION- 2015/2016

TTI3236-FABRIC STRUCTURE AND ANALYSIS

DURATION: 3 HOURS

DATE: 28th NOVEMBER 2016   TIME: 0930-1230 HOURS

This question paper comprises 09 questions. You are required to answer a total of 06 questions.

Answer the 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) marks each.

1. (a) What are the possible move numbers for 10 end sateen weave? Explain how you

   obtained the answer.   (4 Marks)

   (b) What do you understand by 'Skip draft' as against 'Straight draft'?   (3 Marks)

   (c) What is the difference between the 'Hopsack weave' and 'Barleycorn weave' with

   reference to structural quality of the fabric?   (4 Marks)

   (d) Briefly state the reasons for introducing extra thick ends in the Bedford cord weave to

   produce wadded Bedford cord weave?   (2 Marks)

   (e) What is the difference between 'Positive warp pile fabrics' and 'Negative warp pile

   fabrics'?   (2 Marks)

   (f) Briefly state the special feature of leno weaving.   (2 Marks)

   • (g) In weft knitting what do you understand by 'Needle loop' and 'Sinker loop'?

        (4 Marks)

   (h) How are interlock structures different to rib structures?   (4 Marks)

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

(8 Marks)

(ii) Develop a combination weave using plain weave and any rib wave and give its drawing-in plan and lifting plan. (7 Marks)

3. (i) Develop a weave combining a 5 end sateen weave and a warp faced twill weave.

(6 Marks)

(iii) Develop a twilled hopsack weave of your choice. (9 Marks)

4. (i) Develop an ordinary honeycomb weave. (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) If you are given the choice to develop a weave design using figuring with extra threads, will you choose extra warp threads or extra weft threads? Give the reason for your choice. (3 Marks)

5. (i) Using the colour and weave effect develop designs showing

   a. horizontal stripes and

   b. vertical stripes (6 Marks)

(ii) Develop a weave design using 2/2 twill weave and a similar 4x4 colouring arrangement both in the warp and weft directions. (6 Marks)

(iii) Draw the drawing-in plan of the design you developed in part (ii) of this question

(3 Marks)

[All the steps involved in the development of weaves in 5(i) and 5(ii) must be shown.]

6. (i) Briefly explain what do you understand by stitching a double fabric by fabric interchange. (5 Marks)

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

7. (i) Briefly explain the technique of producing velvet structure. (6 Marks)

(ii) What are the different ways in which variations could be introduced to warp pile fabrics? (6 Marks)

(iii) Briefly state how corded velveteens fabrics or popularly known as corduroys are produced. (3 marks)

8. (i) Explain how tuck stitches are realized in a weft knitting machine. (3 Marks)

(ii) Draw the lapping diagram of the knitted structures whose structures whose chain notations are given below: (12 marks)

a. Front bar: 1 – 0 / 0 – 1   b. Front bar: 1 – 0 / 4 – 5   c. Front bar: 1 – 2 / 1 – 0

    Back bar: 3 – 4 / 1 – 0   Back bar: 1 – 0 / 1 – 2   Back bar: 1 – 0 / 2 – 3

9. A fabric 250cm wide (loom state)is woven on a loom which has a reed length of 260cm with a 20 tex warp and 16 tex weft yarns. The number of ends per centimetre is 24 and the number of picks per centimetre is 32. Add 20 ends on each side for selvedges. The count of the selvedge yarn is same as that of the warp yarn. The length of the fabric required is 5000 metres. Allowance for waste is 4% for the warp and 2% for the weft. If the warp crimp is 7%, calculate the areal density of the fabric. Also calculate the amount of yarn required for the main fabric (warp and weft separately) and the selvedges.

(15 marks)