THE OPEN UNIVERSITY OF SRI LANKA

BACHELOR OF INDUSTRIAL STUDIES /

BACHELOR OF TECHNOLOGY

FINAL EXAMINATION – 2005 / 2006

TTX5235 FABRIC TECHNOLOGY

DURATION - THREE HOURS

DATE: 05th April 2006   TIME: 09.30 – 12.30 HOURS

Total Number of Questions = 10   Number of questions to be answered = 06

Answer the question 1, <u>which is compulsory</u>, and five (05) additional questions. Question 1 carries twenty five (25) marks and questions 2 to 10 carry fifteen (15) marks each.

01. <u>Compulsory Question</u>

a) What is a fabric?   (02 Marks)

b) Distinguish between "Properties" and "Characteristics" of fabrics.   (02 Marks)

c) What do you understand by "Fabric Hand"?   (01 Mark)

d) State four properties/characteristics of fabrics, which may influence the comfort of the garments made out of them.   (02 Marks)

e) State four different types of "technical textiles" and identify the most suitable fibre material / blend for these products.   (02 Marks)

f) Distinguish between "Dobby Fabrics" and "Jacquard Fabrics".   (02 Marks)

g) How can we make a warp faced plain weave fabric? Give two examples (trade names) for such fabrics.   (03 Marks)

h) What is a "Comfort Stretch" fabric?   (01 Mark)

i) Give four most important constructional parameters to be indicated in a fabric specification sheet.   (02 Marks)

j) What is a Flannel Fabric?   (01Mark)

k) Draw the loop diagrams of a "Tuck Stitch" and a "Float Stitch".   (04 Marks)

l) What is a "Wet-Relaxed" Fabric?   (01 Mark)

m) Distinguish between "Flat Bed" and "Circular Bed" Knitting Machines.   (02 Marks)

02. A garment buyer requires to make a trouser suitable for **construction workers in a tropical country**. Select a fabric suitable for such a product and discuss the utility, durability and product production & working characteristics to be possessed by the selected fabric. (15 Marks)

03. Discuss and compare the importance of Style, Durability, and Utility characteristics of the following house-hold fabrics:
- Bed linen
- Curtains
- Towelling
- Carpets (15 Marks)

04. a) Explain with the help of a suitable sketch how warp and weft yarns are held together in a woven fabric. (07 Marks)

b) Discuss how any changes in cloth sett affect the crimp of warp and weft yarns and forces acting against unraveling of the fabric. (08 Marks)

05. An order has been obtained to manufacture a water absorbent flannel fabric with a smooth, raised surface. Explain how such a fabric could be made by weaving. Give details about the fibre material and yarn to be selected for warp and weft, fabric construction, details about weaving and problems associated with the production of such a fabric. (15 Marks)

06. Compare woven and knitted fabrics with respect to tensile strength, tearing strength, elongation, elasticity, abrasion resistance, snagging, dimensional stability, shrinkage, wrinkle resistance, and heat insulation properties. (15 Marks)

07. a) What do you understand by "Bedding" in woven fabrics? (05 Marks)

b) Explain how intensity of bedding is affected by the number and direction of twist of warp and weft yarns. (06 Marks)

c) How does bedding will affect shear and drape of fabrics? (04 Marks)

08. a) Explain "Rib Gating" and "Interlock Gating" with the help of suitable sketches (07 Marks)

b) Sketch the needles and needle bed arrangements required to knit

(i) Plain fabric

(ii) Purl fabric (08 Marks)

09. a) Explain the reasons for low dimensional stability of knitted fabrics. (05 Marks)

b) A knitter wishes to make a fabric on a particular machine so that it has a specified width after the wet treatment. The details available are as follows:

Fabric Specifications: Plain knitted fabric, to be finished to 40 cm width (tubular). The diameter of the machine is 38 cm and the number of needles per cm is 6.

   (i)   Calculate the stitch length and the stitch density of the fabric.
   (ii)   Calculate the count of yarn required, to knit a fabric with above specifications and with a fabric area density of 250 g/m^2.

   Assume a finished-relaxed relaxation constant of 2360. (10 Marks)

10. a) What do you understand by the "Cover Factor" of a knitted fabric? (03 Marks)

b) State the assumptions made in deriving the cover factor of a knitted fabric.

(04 Marks)

c) Determine the fractional cover and the cover factor of a wet-relaxed plain knitted fabric made out of 70 Tex yarn with a stitch length of 5.0 mm. The density of the fibre is 1.3 g/cm^3 and the wet-relaxed relaxation constant is (k_s) 2160. (08 Marks)