THE OPEN UNIVERSITY OF SRI LANKA

BACHELOR OF INDUSTRIAL STUDIES / BACHELOR OF TECHNOLOGY

FINAL EXAMINATION (S) 2007 / 2008

TTX5235 FABRIC TECHNOLOGY

DURATION - THREE HOURS

030

DATE: 24th May 2008 **TIME: 13.30-16.30 HOURS**

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

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

01. Compulsory Question

a) Give two different examples each for types of fabrics
   i. made straight away **from fibres** and (01 %)
   ii. made **from yarns.** (01%)

b) Give two different examples each for different types of
   i. **composite** fabrics and (01 %)
   ii. **multi-component** fabrics. (01 %)

c) Distinguish between **transmission** and **transformation** characteristics of fabrics. (02 %)

d) Comfort is affected by the design of a garment. However fabrics and their properties affect the comfort of any garment more that the garment design itself. State four (04) different fabric properties/ characteristics which may influence the comfort. (02 %)

e) Warp and weft yarns of the woven fabrics are kept together by the frictional forces generated at crossover points. Explain in brief how any change of warp / weft yarn density at constant yarn counts affects the frictional forces generated at cross over points. (03 %)

f) Distinguish between **yarn dyed** fabrics and **printed** fabrics. (01 %)

g) Explain how leno weaving is helpful in making relatively open but stable, net like woven fabrics. (02 %)

h) "Satin/sateen fabrics can be produced to have exceptional wind resistance." Explain why? (02 %)

i) "Wool and certain textured synthetic fibres are valuable for articles of warm clothing. "Explain why? (02 %)

j) Distinguish between "Poplin" and "Irish Poplin" fabrics. (02 %)

k) Distinguish between "Transfering" and "Racking" in relation to weft knitting. (02 %)

l) What is a "Jacquard-knit"? (02 %)

m) Sketch a cam (showing the needle path profiles) suitable to control the movement of knitting needles used on a double jersey interlock machines. (02 %)

n) State the two assumptions made during the derivation of a formula to calculate the cover factor of knitted fabrics. (02%)

o) Define the following terms with respect to geometry of warp knitted fabrics:
-Rack
-Run-in (02%)

02) Discuss and compare the importance of Style, Durability, and Utility characteristics of the following fabrics:
a) Mosquito net fabric
b) Carpet used in the lobby of a hotel
c) Leggings (Body fitted ladies trousers) (14 %)

03) Discuss the specific properties and characteristics you expect from the following technical fabrics and how you would design them to meet these requirements:
a) Tyre Cord fabric
b) Fabrics used as implants (14 %)

04) "A fabric retailer usually puts a small cut and then tear when he separates a plain woven fabric. But in the cases of twill and satin/sateen fabrics he uses a pair of scissors to cut and separate the fabric across the whole width" Explain the reasons for the above behaviour using suitable sketches to reinforce your arguments. (14 %)

05) The plain weave is a balanced weave. However we can produce unbalanced plain weave fabrics by using suitable yarn counts and fabric sett.
a. Explain how you would proceed to produce a weft faced plain weave fabric fabric. (07%)
b. Discuss the additional problems you expect in weaving of such a fabric against weaving of a balanced plain weave fabric. (07%)

06) Explain the reasons for the following observations:

a) High warp cover in warp satin is effective in producing a smooth warp face.(08 %)

b) Satin fabrics have high wrinkle resistance and resistance to wind and rain. (06 %)

07) You have to produce a large quantity of a shirt for office workers in Sri Lanka and wish to place an order for the fabrics. Prepare a specification sheet to be sent to your fabric supplier. (Hint: Important is the format and the content of the specification sheet not the values of different quantites.) (14 %)

08) a) Draw the yarn path diagrams of 1x1 and 2x2 rib fabrics. (03%)

b) A 'Full Cardigan' is a double jersey fabric produced using rib gating. This structure is produced, by combining tuck stitches and normal stitches. For the first course, normal stitches are knitted on one bed and tuck stitches are knitted on the other bed. For the next course, the process is interchanged. Draw the yarn path diagrams for two subsequent courses of this structure. (03%)

c) Half Cardigan fabric is produced when one needle bed produces tuck stitches and normal stitches alternately for subsequent courses whereas the other needle bed produces only normal stitches for all courses. Draw the yarn path diagrams for two subsequent courses of this structure. (03 %)

d) Compare the bulkiness and area density of these two fabrics with those of the 1x1 normal rib fabric produced using the same yarn. (05%)

09) a) The length of one course of yarn unraveled from a sample of a plain knit fabric is 14 cm. On face side of this fabric sample 20 wales can be counted. Determine the loop length of this knitted structure. (03%)

b) Assuming the fabric is wet relaxed, determine the number of courses and number of wales per cm as well as the stitch density of the above fabric. (k_c = 53 and k_w = 41) (06%)

c) Calculate the yarn length required to knit 1000 square metres of the wet relaxed fabric. (05%)

10) a) What is a plated fabric? (05 %)

b) What is a partially threaded guide bar? Explain how partially threaded guide bars can be used to knit net structures. (05 %)

c) Describe with the aid of a suitable diagram how a fall plate knitted structure is produced, (04 %)