THE OPEN UNIVERSITY OF SRI LANKA

BACHELOR OF INDUSTRIAL STUDIES /

BACHELOR OF TECHNOLOGY

FINAL EXAMINATION 2011 / 2012

TTX5235 FABRIC TECHNOLOGY

DURATION - THREE HOURS

DATE: 04th March 2012   TIME: 0930 - 1230 HOURS

Total Number of Questions = 09   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) Name three major groups of fabrics which are categorized according to the **end-uses.**   (03%)

b) Briefly explain the followings:
    i. Coated fabric   (01 %)
    ii. Laminated fabric.   (01 %)

c) State two examples for each **hand** and **tactile** characteristics of fabrics.   (02 %)

d) State four different properties/characteristics of **textile** fabrics which are not possessed by other non-textile planar/flat structures.   (02 %)

e) Name two major types of "Utility Characteristics".   (02 %)

g) Explain why a fabric used as an **implant** must have a certain amount of **porosity.**   (02 %)

h) "Fabrics with longer floats have higher tearing strength than Plain weave fabrics". Explain Why?   (02 %)

k) Distinguish between "half cardigan" and "full cardigan" in relation to weft knitting.   (02 %)

l) What do you understand by racking as known in flat bed weft knitting?   (02 %)

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

n) Explain three different relaxation constants considered in the calculation of stitch length of plain knitted fabrics with known stitch density and courses or wales per unit length. (02%)

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

----

02) a) Woven fabrics can be classified according to several criteria. Explain two classification charts, according to colour and according to surface effect. (08 %)

b) Briefly explain the three sub categories of "style characteristics" by giving two descriptive examples for each category. (07%)

03) a) Discuss the specific properties and characteristics you expect from the following technical fabrics and how would you design them to meet requirements stated by you:
i) Filter fabric
ii) Floor covering (08 %)

b) Briefly explain "product production and working characteristics". Further, explain the differences between "pressing mouldability" and "die mouldability", which come under product production and working characteristics. (07 %)

04) a) Two different woven fabrics of plain weave and sateen weave were produced using same weft and warp yarns and same weft and warp densities. However it was observed that the two fabrics have different tearing strengths. Explain the reasons for above observation using suitable sketches to reinforce your arguments. (08 %)

b) Forces required forces to pull out yarns from the above two fabrics are different. Explain the reasons for this behavior elaborating theories on which your explanation is based. (use suitable sketches to reinforce your explanation). (07 %)

05) a) State the possible variations of fabric parameters to produce unbalanced fabrics. (07%)

b) Discuss the additional difficulties you would expect in weaving of weft faced plain weave fabrics. (08%)

06) a) Materials for different garments must have different fabric handle characteristics. Discuss the handle characteristics such as roughness, hardness, smoothness, softness and springyness expected from fabrics suitable for trousers, evening dresses, shirts, underwears and Saaris.

(08 %)

b) Briefly explain the characteristics of fabrics, which contribute towards comfort of the wearer.

(07 %)

07) a) Draw the yarn path diagrams of interlock and eight lock structures. (05%)

b) Draw the yarn path diagrams and point paper notation of two subsequent courses of full cardigan structure. (05%)

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

08 a) Briefly explain the relationship between width of wales, wales per cm and the wale wise relaxation constant. (03%)

b) Calculate the stitch density, yarn length in one squire meter and the required length of yarn to produce 1000 square meters of wet relaxed plain knitted worsted fabric with average stitch ength of 5mm. Assume a wastage of 4% of yarn during the production. Relaxation constants of wet plain fabrics are ks = 2160, kw =41 and kc = 53. (12%)

09) a) Explain the practical importance of double needle warp knitted spacer fabrics. (05 %)

b) Explain how warp knitted net structures are produced. State the minimum technical requirements to produce net structures during warp knitting process. (05 %)

c) Describe with the aid of a suitable diagram how a fall plate knitted structure is produced, (05 %)