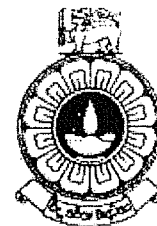


THE OPEN UNIVERSITY OF SRI LANKA
 DEPARTMENT OF TEXTILE AND APPAREL TECHNOLOGY
 BACHELOR OF INDUSTRIAL STUDIES HONOURS
 FINAL EXAMINATION- 2015/2016
 TTX3237-FIBRE TO FABRICS
 DURATION: 3 HOURS



Date: 21st November 2016

Time:0930-1230hrs

Answer **question 1**, which is **compulsory**, and additional **five (05)** questions.

Question 1 carries twenty five (25) marks and question 02 to 08 carry fifteen (15) marks each.

Compulsory Question

- Q1.** (a) What are the three (03) types of natural vegetable fibers and give one (01) example for each type. (6 marks)
- (b) Give one (01) example for each of the following man-made fiber types.
 (i) Regenerated cellulose (ii) Polyurethan (iii) Polyvinyl (3 marks)
- (c) Give the special features of microscopic views of a cotton fibre . You may consider the cross sectional and longitudinal microscopic views. (2 marks)
- (d) Draw a flow chart to show all the basic stages of cotton yarn spinning process. (5 marks)
- (e) Write down a formula to show the relationship between tex count and English cotton count (Ne) used in converting yarn counts (2 marks)
- (f) Give the stages of preparation warp beam starting from ring bobbins. You may draw a flow chart to indicate the stages. (5 marks)
- (g) What is the main difference between warp knitting and weft knitting techniques? (2 marks)

Select any five (05) questions from Q2 to Q8

Q2. (a) "In a single cotton fibre, higher percentage of crystalline and lower percentage of amorphous regions are available". Explain this statement by differentiating crystalline and amorphous arrangements using a suitable diagram. (3 marks)

(b) (i) What do you mean by "Degree of crystallization" and how does it affect on the strength of a textile fibre. (3 marks)

(ii) Briefly explain the relationship between degree of crystallization and dye absorbency and thermal properties. (3 marks)

(c) Draw sketches to show the cross sectional and longitudinal microscopic views of wool and silk fibres. (6 marks)

Q3. (a) Give the reasons for following behaviors of cotton.

(i) Ability to withstand for higher temperatures during processing and ironing.

(ii) Chemical reaction with acids and alkalis. (6 marks)

(b) Briefly explain the following properties of wool fibers with giving reasons.

(i) Poor thermal conductivity

(ii) Good elastic plastic nature (4 marks)

(c) Briefly explain the effect of acids and effect of alkalis on silk with giving reasons (5 marks)

Q4. (a) Compare dry strength, wet strength and thermal properties of cotton and viscose fibres. (6 marks)

(b) Give the reasons for following properties of Nylon materials.

(i) Very high elasticity and recovering properties

(ii) Damage by acids (4 marks)

(c) (i) Why spandex shows excellent stretching and recovering properties by using a suitable sketch? (3 marks)

(ii) Why acrylic fibres are today heavily used for warm clothing? (2 marks)

- Q5. (a) (i) With using a chart, show the main two yarn count systems and their different units?
 (ii) Yarn has a count of 200decitex. Convert this count into tex, denier and cotton count (Ne). (7 marks)
- (b) Briefly explain why opening and cleaning operations are carried out in a blow room. (4 marks)
- (c) What do understand by “Carding” and “Stripping” actions done in a carding machine? (4 marks)
- Q6. (a) Give the two (02) main objectives of using a draw frame machine. (4 marks)
- (b) (i) Give the input and out put of flyer frame(Roving frame) and ring frame machines. (4 marks)
 (ii) Give two (02) objectives of combing. (2 marks)
- (c) What do understand by “Open end spinning” technique and draw a labeled diagram to show open end technique. (5 marks)
- Q7. (a) What do you understand by following process steps used in warp preparation?
 (i) Winding (ii) Sizing (iii) Drawing in (6 marks)
- (b) A cotton woven fabric is produced to following specifications:
 Warp: 60^S English count, 120 ends/ inch, crimp 3%
 Weft: 40^S English count, 160 picks / inch, crimp 5%
- Calculate
 (i) Cloth cover factor(K_C)
 (ii) Length of warp yarns taken out of a fabric of 12 feet length
 (iii) Length of a weft yarn taken out of a fabric of 36 inches width (6 marks)
- (c) Give any three (03) problems occur in a conventional shuttle loom. (3 marks)
- Q8. (a) Briefly explain the followings related to the given weft knitted fabrics. (4 marks)
 (i) Fabric face and back side appearances
 (ii) Needle bed arrangement in the knitting machine during 1x1 rib fabric manufacturing

- (b) Draw point paper diagram and a yarn path diagrams for,
(i) 2x2 rib knitted structure
(ii) Modify the above mentioned 2x2 structure by inserting a “ float or miss”
stitch. (5 marks)
- (c) Give two(02) examples for each of the following application areas of nonwovens.
(6 marks)
- (i) Hygiene (ii) Medical (iii) Geotextiles