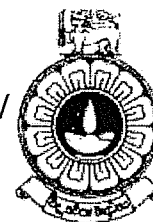


THE OPEN UNIVERSITY OF SRI LANKA
 DEPARTMENT OF TEXTILE & APPAREL TECHNOLOGY
 BACHELOR OF TECHNOLOGY HONOURS IN ENGINEERING/
 BACHELOR OF INDUSTRIAL STUDIES HONOURS
 FINAL EXAMINATION– 2015/16
 TTX6260 – ADVANCED WOVEN FABRIC TECHNOLOGY
 DURATION: 3 HOURS



DATE: 10th December 2016

TIME: 09.30-12.30 hours

Total Number of Questions = 08

Number of questions to be answered = 06

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

Question 1 carries thirty (30) marks and questions 2 to 8 carry fourteen (14) marks each.

01. Compulsory Question

- (a) Illustrate how “Winding Ratio” (Wind) varies with increasing package diameter in the case of a random cross-wound package. (02Marks)
- (b) What do you understand by the term “Gain” as used in the winding process of precision wound packages? (02Marks)
- (c) State four (04) factors which affect the productivity of a sectional warper. (02Marks)
- (d) Draw a characteristic curve to show the relationship between end breakage rate during weaving and the size percentage of the warp. (02Marks)
- (e) What is “Quick Style Changing”? (02Marks)
- (f) Explain in brief why conventional lever and cam dobbies can't be run at high speeds like modern rotary dobbies. (02Marks)
- (g) State two (02) advantages of electronic cloth take-up mechanisms. (02Marks)
- (h) Explain in brief how “Shedding” and “Weft Insertion” are done in the Sulzer-Rueti M8300 multi-phase loom. (02Marks)
- (i) Why do we have a variety of “Drop wires” of different shape and weight? (02Marks)
- (j) State two (02) requirements of the fabric selvedge. (02Marks)

- (k) What are the problems caused by improper use of compressed air or stationary compressed air nozzles to clean weaving machines? (02Marks)
- (l) State two purposes of using weft accumulators in modern high speed shuttle-less looms. (02Marks)
- (m) What is the main reason for slow replacement of shuttle looms with modern shuttle-less looms in Asian countries? (02Marks)
- (n) Distinguish between "Overall efficiency" and "Mill Efficiency" of a weaving plant. (02Marks)
- (o) What is a "Feasibility Study"? (02Marks)

Answer any five questions from the following Questions 2 to 8.

02. a) Distinguish between "Wind" and "Traverse Ratio". (04Marks)
- b) Draw the pattern repeat of a yarn wound with a traverse ratio of 3.5 on to a cylindrical centre tube. (04Marks)
- c) Using the above pattern repeat, explain how the problem of "patterning" occurs when packages are wound with a constant traverse ratio. (02Marks)
- d) Explain how patterning occurs in random winding. (04Marks)
03. a) Define the following terms:
 i) Size Concentration ii) Size Take-up iii) Size Percentage
 iv) Moisture regain (06Marks)
- b) Explain how the following factors would affect size take-up and size percentage:
 i) Size Concentration ii) Viscosity iii) Machine speed iv) Squeeze roller pressure (08Marks)
04. a) State the advantages of "Air jet weaving". (04Marks)
- b) Explain in brief three (03) technical disadvantages of air jet weaving. (06Marks)
- c) Describe the standard condition of air required for air-jet weaving. (04Marks)
05. Write an essay on "Multi-phase looms". You must explain the reasons leading to develop such looms, different types of multi-phase looms, problems associated with different types of looms and present state of multi-phase weaving. (14Marks)

06. a) Explain in brief why temples are necessary in weaving machines. (04Marks)
- b) State four (04) different types of temples used on weaving machined and describe the constructional features and operational principle of one of those temple types with the aid of a labeled line diagram. (10 Marks)
07. Calculate the machine running efficiency and overall efficiency of a group of 8 weaving machines looked after by one operator. The details of the fabrics produced on the looms are given below:

	Loom 1	Loom 2	Loom 3	Loom 4	Loom 5	Loom 6	Loom 7	Loom 8
Warp density at reed, 1/cm	30	40	30	40	30	30	40	40
Reed-in width, cm	110	130	110	130	110	130	130	130
Machine speed, rpm	425	380	420	375	430	425	370	385

- Average number of warp breaks per 100,000 picks, 10,000ends = 16
- Average number of weft breaks per 100,000 picks = 12
- Number of other stoppages per 100,000 picks = 05
- Average repair time of a warp break = 30s.
- Average repair time of a weft break = 20s.
- Average time to attend other short term stoppages = 15s.

Repair time also includes time loss due to machine interference. Last 10 minutes of the each 8 hour shift is spent for machine cleaning during which all the machines are kept stopped. First 5 minutes of each shift is unproductive due to shift change. In average one of the eight machines is kept stationary for 15 minutes once every three shifts due to random maintenance work.

(14 Marks)

08. a) Write a descriptive note comparing cost of weaving in shuttle-less and shuttle weaving. (08Marks)
- b) Describe in brief the following fabric defects:
- i) Weft bar ii) Crack/Split iii) Weft float iv) Warp float (06Marks)