The Open University of Sri Lanka

Faculty of Engineering Technology

Department of Textile and Apparel Technology

Study Programme	: Bachelor of Technology Honours in Engineering / Bachelor of Industrial Studies Honours
Name of the Examination	: Final Examination
Course Code and Title	**: TAX6560/TTX6260 Advanced Woven Fabric Technology**
Academic Year	: 2019/2020
Date	: 26th September 2020
Time	: 1330 -1630hrs
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of Eight (8) questions in Four (4) pages.
3. This is a Closed Book Test (CBT).
4. Write down your Index Number in all the pages of answer scripts.
5. Answer the question one (01), which is compulsory and five (5) more questions from question two (02) to question eight (08). Question one (01) carry thirty (30) marks and questions two (02) to question eight (08) carry fourteen (14) marks each.
6. Answer for each question should commence from a new page. If a question has many parts, all the parts should be answered in the chronological order under the same question.
7. Write down the answered question numbers in the answer book.
8. Do not write answers to the additional questions.
9. Answers should be in clear hand writing.
10. Do not use red colour pens.

Compulsory question

01.

a) State four (04) different criterions used to classify winding machines. (02 marks)

b) Explain the difference between "Knotting" and "Splicing". (02 marks)

c) State the purpose of "Doubler winder". (02 marks)

d) Draw the pattern repeat for a traverse ratio of 3. (03 marks)

e) Define the "Warp stretch" related to warp yarn sizing. (02 marks)

f) Define the term "Style Changing" in weaving. (02 marks)

g) Write two (02) advantages of rotary dobby shedding mechanism. (02 marks)

h) State two (02) advantages of Sulzer projectile picking mechanism over shuttle picking mechanism. (02 marks)

i) Write two (02) problems associated with multi-phase weaving machines. (02 marks)

j) State two (02) main functions of "Reed" which is one of the most important items of the beat-up mechanism. (02 marks)

k) Write four (04) different types of selvedges made on shuttle-less weaving machines. (02 marks)

l) State four (04) different criterions used to classify weaving defects. (02 marks)

m) The air jet loom is used to weave a fabric with 90 cm used reed-in width and the projectile loom is used to weave a fabric with 100 cm used reed-in width. Calculate the actual weft insertion rates of both machines, if they operate at speeds 400 rpm and 600 rpm respectively. (05 marks)

Answer any five (05) questions from the following seven (07) questions.

02.

a) Describe the packages produced on modern winding machines given below. (04 marks)

   i. Random or open cross wound packages

   ii. Precision cross wound packages

b) Discuss two (02) disadvantages for each of the above package types. (04 marks)

c) Briefly explain the winding method that has been introduced to overcome the above disadvantages of random and precision wound packages. (06 marks)

03.

Weaver's beam with 3000 m long warp having 4000 ends of 30 tex cotton yarn is to be produced. A sectional warping machine is available for this purpose. The creel capacity of the warping machine is 500. Each creeling is sufficient for two beams and assume that 2% waste of yarn. The warping speed of the machine is 600 m/min while beaming speed is 50 m/min. The processes of warping and beaming have machine stop times due to several reasons:

- It takes about 0.3minutes to creel a supply package and to tie in the end.
- It takes 3 minutes per section for leasing and moving the traverse.
- It takes in average about 1.2 min to repair a breakage and the average number of breaks during warping is about 3.5 per 1 million meter yarn.
- Time taken to prepare the warp for beaming and change of the beam is about 7.5 min.

Calculate the followings.

a) Calculate the weight of yarn available on each supply package. (04 marks)

b) Calculate the duration of time the warping machine has to run for warping of all the sections and beaming of the two weavers' beams. (04 marks)

c) Calculate the total time taken to produce the two weavers' beams and the running efficiency of the warping machine. (06 marks)

04.

a) A 15 tex cotton warp having 6000 ends and a length of 5500 m has been sized. The mass of the warp beam after sizing is 750 kg. The mass of the oven dry sized warp beam is 670 kg. The mass of the empty warp beam is 100 kg. The moisture regain of the cotton warp before sizing was 8.5%.

   i. Determine the moisture regain of the sized warp (04 marks)

   ii. Determine the size percentage of the sized warp (04 marks)

b) Discuss how size take – up is influenced by concentration, viscosity and the temperature of the size paste. (06 marks)

05.

a) Write four (04) advantages of electronically controlled dobby using microprocessors. (04 marks)

b) Briefly explain the operating principle of electronic jacquard shedding mechanism. (05 marks)

c) Write five (05) advantages of electronic jacquard shedding mechanism over mechanical jacquard shedding mechanism. (05 marks)

06.

a) Explain the operating principles of the following rapier weaving mechanisms. (10 marks)

i. Telescopic rapier weaving mechanism

ii. Two phase rapier weaving mechanism

b) Write one (01) advantage and one (01) disadvantage of each of the above rapier weaving mechanisms. (04 marks)

07.

a) Compressed air used in air – jet weaving should meet some essential requirements for smooth weaving process without any defects, disruptions and loss of efficiency. Briefly describe any two (02) essential requirements. (06 marks)

b) Write four (04) advantages and four (04) disadvantages of air – jet weaving. (08 marks)

08.

a) Briefly explain why temples are necessary on a weaving machine. (03 marks)

b) Write short notes on any three (03) types of temples used on a weaving machine. (09 marks)

c) Introduce two (02) quality problems associated with temples. (02 marks)

-End of the question paper-