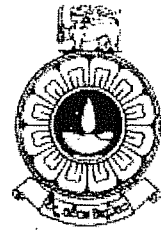


THE OPEN UNIVERSITY OF SRI LANKA  
DEPARTMENT OF TEXTILE & APPAREL TECHNOLOGY  
BACHELOR OF INDUSTRIAL STUDIES HONOURS  
FINAL EXAMINATION – 2015/2016  
TTX6265/TTX5235- FABRIC TECHNOLOGY  
DURATION-3 HOURS

00099



Date: 29<sup>th</sup> November 2016

Time: 0930-1230Hrs

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 twenty five (25) marks and the questions 2 to 8 carry fifteen (15) marks each.

**01. Compulsory question**

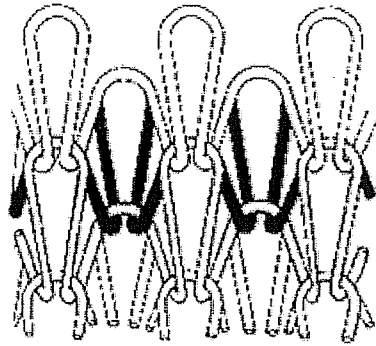
- a. Give three (03) advantages of laminated fabric with respect to other fabrics. (02 Marks)
- b. State three (03) reasons for high cost incurred with the production of weft faced plain woven fabric. (03 Marks)
- c. Briefly explain the phenomenon of **crimp interchange** pertaining to woven fabrics. (02 Marks)
- d. Explain why pilling resistance is high in woven fabrics compared to knitted fabrics. (02 Marks)
- e. State four (04) functions of a clothing fabric. (02 Marks)
- f. Define the term 'geo-textiles'. (02 Marks)
- g. What do you understand by half set threading related to warp knitting guide bars? (02 Marks)
- h. Give three (03) differences between warp and weft knitting processes. (02 Marks)
- i. State the main difference between **rib** gaiting and **interlock** gaiting. (02 Marks)
- j. State two (02) types of rib fabric designs with tuck and miss stitches. (02 Marks)
- k. Draw the lapping diagrams for the warp knitted fabric structures given below by chain notations.
  - i. 1-0/1-2
  - ii. 3-2/3-4/2-1/3-4 (04 Marks)

-----End of the compulsory question-----

02. (a) Distinguish between the terms **physical properties** and **physical characteristics** of fabrics. (02 Marks)
- (b) Describe the importance of assessing visual characteristics of a fabric for a particular use. (04 Marks)

- (c) Describe in detail two (02) **utility characteristics** that must be assessed when selecting a fabrics for each of the below application.
- A. Fabric for a swimming suit
  - B. Fabric for a seat cover
  - C. Fabric for an astronaut suit
- (09 Marks)
03. (a) Briefly explain three (03) properties and characteristics that are highly influenced the comfort properties of a clothing fabric. (06 Marks)
- (b) Explain in detail two (02) durability characteristics, which must be possessed by each of the fabrics that you are expecting to select for the following each application:
- A. Fabric for a conveyer belt
  - B. Fabric for air bags of automobiles
  - C. Fabric for a infant wear
- (09 Marks)
04. (a) With the aid of suitable sketches explain the following phenomenon related to woven fabrics.
- A. Low tearing strength of plain woven fabrics compared to comparable satin/sateen woven fabrics.
  - B. The requirement of a higher force to pull out a weft or a warp yarn from a plain woven fabric than from a comparable satin fabric made out of the same yarn.
  - C. High wrinkle resistance of satin fabric compared to comparable plain woven fabric.
- (12 Marks)
- (b) Describe the reasons for selecting twill woven fabrics over plain woven fabrics for hard wear clothing. (03 Marks)
05. (a) Compare the following properties and characteristics of woven and knitted fabrics.
- A. Dimensional stability
  - B. Wrinkle resistance and recovery
  - C. Strength of the fabric
- (09 Marks)
- (b) Draw detailed classification charts for any two (02) of below criteria, according to which woven fabrics can be classified.
- A. According to colour design
  - B. According to surface character
  - C. According to end-use
- (06 Marks)

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6. (a) Compare machine, process and structural features of 1x1 purl knitting and interlock knitting. (06 Marks)
- (b) Draw point paper notations and yarn path diagrams for the loop diagram of a knitted fabric given below. (05 Marks)



- (c) With the use of suitable sketches explain how cable designs are produced in double jersey knitted fabrics. (04 Marks)
07. A knitter wishes to make a plain knitted fabric on a circular plain knitting machine. The Fabric specifications are as below.  
 Plain knitted fabric to be wet-finished to 47.12 cm width (tubular). The diameter of the machine is 35 cm and the gauge of the machine is 6 needles/cm. (wet relaxed constants  $k_s=2160$ ,  $k_e=53$  and  $k_w=41$ ) considering the above specifications calculate the following.
- Total number of wales in the fabric. (03 Marks)
  - The stitch length of the fabric. (03 Marks)
  - The stitch density of the fabric. (03 Marks)
  - If 18000m of yarn weight 360g, the linear density of yarn in tex. (03 Marks)
  - The areal density of the fabric. (03 Marks)

08. (a) With the aid of diagrams briefly explain how warp knitted plated fabrics are produced on tricot warp knitting machine. (05 Marks)

- (b) Draw the lapping diagrams for the guide bar movement represented by the following chain notations.

Chain notation of the front bar: 1-0/3-4/2-1/2-3

Chain notation of the back bar: 3-4/1-0/2-3/2-1 (04 Marks)

- (c) A warp knitted dress material is to be produced and it should have 16wales/cm and 20courses/cm in grey state. The run-in is 170 cm for the front bar and 160cm for the back bar. Both bars are fed with 10tex polyester yarns. Calculate the areal density of this fabric in  $g/m^2$ . (06 Marks)