



(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 161852**

Roll No.

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**B. Tech.**

(SEM. VIII) THEORY EXAMINATION, 2014-15  
**THEORY OF TEXTILE STRUCTURE**

Time : 3 Hours]

[Total Marks : 100

Note: - Attempt all questions. All questions carry equal marks.

- 1 Attempt any two parts of the following
  - (a) Derive the following expression for finding out yarn diameter
  - (b) Discuss theoretical analysis of yarn irregularity.
  - (c) Derive an expression relating twist angle with twist factor.
  
- 2 Answer any two parts of the following
  - (a) Describe estimation of properties and strength of blended yarns.

- (b) Discuss the various assumptions of idealised helical geometry for twisted yarns.
- (c) Establish relationship between filament extension and yarn extension taking into account only tensile forces and assuming that there is no change in yarn diameter.
- 3 Answer any two parts of the following :
- (a) Prove that  $R_y = \tan^2 \alpha / 2$ , where  $R_y =$  retraction.
- (b) For constant volume deformation of yarn prove that  $\epsilon_r = \epsilon_y \left( \cos^2 \alpha - 0.5 \sin^2 \alpha \right)$  where symbols have their usual meaning.
- (c) Define migration of fibres in yarn. Discuss different parameters to characterise migration.
- 4 Attempt any two parts of the following :
- (a) For square set fabric, prove that. Where  $t = \tan \phi / 2$
- (b) Discuss in detail the plain woven pierce geometry and its assumption and prove that  $d_1 + d_2 = h_1 + h_2$ .
- (c) Derive the seven equations of pierce geometry with the help of neat diagram.
- 5 Attempt any two parts of the following
- a) What do you understand by fabric cover, fraction cover and cover factor?
- b) A plain woven fabric consists of following particulars: warp count = 30 Ne, weft count = 36 Ne, EPI= 40, PPI= 36. Calculate the warp cover factor, weft cover factor, and total cover of the fabric.
- c) Discuss the phenomenon of crimp interchange of woven fabric and derive the expression governing the phenomenon.