

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2172904****Date:25/01/2021****Subject Name:Yarn Structure & Fabric Geometry****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define the terms: a) Twist b) Twist multiplier **03**
(b) State role of yarn structure on yarn and fabric properties **04**
(c) Derive the equation: $\tan \alpha = 0.0112 V_y \frac{1}{2} \tau$. **07**
- Q.2** (a) What do you mean by twist contraction and retraction factor? **03**
(b) State phenomenon of Crimp interchange. **04**
(c) Derive the equations to calculate warp cover factor & weft cover factor. **07**
- Q.3** (a) State classification of yarn. **03**
(b) Draw figure of idealized twist geometry and derive five basic equations. **04**
(c) Describe the disturbing factors that operate in determining real yarn structures. **07**
- Q.4** (a) Define with reference to migration: **03**
a) Mean fibre position (\bar{y}) b) RMS deviation (D),
(b) Explains Hamilton – Coil winding method of measuring yarn diameter. **04**
(c) Derive the Retraction factor, $R_y = \tan^2 (\alpha/2)$. **07**
- Q.5** (a) State importance of cloth cover. **03**
(b) Find the cloth cover if warp count & epi is 30's & 62 respectively and weft count & ppi is 24's & 46 respectively. **04**
(c) Establish the relationship between k & d/p for maximum cover. **07**
- Q.6** (a) Discuss about modulus of elasticity. **03**
(b) What do you mean by Fractional cover of warp and weft? **04**
(c) Explain the geometry of jammed condition for Race track cross-section. **07**
- Q.7** (a) Define with reference to fabric: a) Isotropic, b) Anisotropic. **03**
(b) Give limitation of fabric geometrical model. **04**
(c) Derive the equations for Pierce's model for the geometry of Plain woven fabric when "Neither of the yarn is straight nor it is jammed." **07**
- Q.8** (a) Define the terms: Poisson ratio. **03**
(b) Explain load-extension curve for the woven fabric showing different zones. **04**
(c) Described the factors that influence yarn tensile properties. **07**
