

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3172904

Date:30-11-2024

Subject Name: Yarn Structure and Fabric Geometry

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define twist contraction and retraction factors. **03**
(b) Explain load extension curve for the fabric with different zones. **04**
(c) Describe Coil winding method for measuring yarn dimensions. **07**
- Q.2** (a) What are the problems during measurement of yarn diameter with the help of microscope? **03**
(b) Write briefly about Schwarz Constant. **04**
(c) What are fundamental structural features of yarn? Show how fibre, yarn and fabric structure and properties are interrelated. **07**
- OR**
- (c) Derive generalized equation for maximum cover (reference standard for K & d/p). **07**
- Q.3** (a) With reference to tensile properties of fabric explain following terms: **03**
(i) Anisotropic (ii) Isotropic (iii) Orthotropic
(b) With the help of figure give the interpretation of strength-twist relationship. **04**
(c) Derive an equation to find the diameter of cotton yarn. **07**
- OR**
- Q.3** (a) Give classification of yarns based on structural aspects. **03**
(b) What are main assumptions of idealized twist geometry? **04**
(c) With reference to migration, write equations for Mean fibre position, root mean square deviation and rate of migration. **07**
- Q.4** (a) Define Ideal migration pattern. **03**
(b) Write on disturbing factors affecting packing of fibres in yarn. **04**
(c) Write short note on close and open packing of fibres in the yarn. **07**
- OR**
- Q.4** (a) Explain the terms work of rupture & work factor. **03**
(b) Find the warp & weft cover factor if, warp count & epi is 60D & 80 respectively and weft count & ppi is 30's & 60 respectively. **04**
(c) Derive all the equations to calculate Fabric cover. **07**
- Q.5** (a) What is difference between K and d/p. **03**
(b) Explain any two tensile properties of fabric. **04**
(c) Derive the equations for the Peirce's geometry of General case when "neither of the yarn is straight nor it is jammed". **07**
- OR**
- Q.5** (a) Explain Poisson's ratio. **03**
(b) What is crimp interchange phenomena. **04**
(c) Derive necessary equation of fabric model for Race-track cross-section. **07**
