GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3172904   **Date:08/06/2022**

Subject Name:Yarn Structure and Fabric Geometry

Time:02:30 PM TO 05:00 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.**

			MARKS
Q.1	**(a)**	With neat diagram discuss the two effects governing Strength-twist relationship.	**03**
	(b)	Write short note on Schwarz Constant.	**04**
	(c)	With the help of coaxial-helix model explain Idealized Helical yarn structure.	**07**
Q.2	**(a)**	Enlist the pertinent physical characteristics that are influenced by twist.	**03**
	(b)	Enlist the fibre properties that are expected to influence fibre compactness.	**04**
	(c)	With the help of neat diagram explain in detail Twist Contraction.	**07**
		OR	
	(c)	Describe Coil winding method for measuring yarn dimensions.	**07**
Q.3	**(a)**	Calculate out Contraction factor, Cy for Twist angle (α) :20°	**03**
	(b)	Define the tems: i. Fibre Modular length ii.Packing fraction.	**04**
	(c)	Hamilton geometry gave the following data: • Major diameter = 230μ = a • Minor diameter = 162 μ = b • Ne = 29.5 Tex • Fibre specific volume = 0.66 cm³/g Estimate φ.	**07**
		OR	
Q.3	**(a)**	Calculate out Retraction factor, Ry for Twist angle(α) :30°	**03**
	(b)	With the help of neat figure explain Migration.	**04**
	(c)	Discuss the parameters used for characterization of migration behavior of fibre.	**07**
Q.4	**(a)**	What is meant by Elastica model of fabric?	**03**
	(b)	Explain Orthotropic& Isotropy.	**04**
	(c)	Derive the equations for the Peirce's geometry of Special case when "Weft yarn is straight and warp is not jammed".	**07**
		OR	
Q.4	**(a)**	Explain Poisson's ratio.	**03**
	(b)	Explain crimp interchange phenomena.	**04**
	(c)	Derive all the equations of fabric cover.	**07**
Q.5	**(a)**	Write the formula to find out warp and weft cover factor in direct and indirect system.	**03**
	(b)	Explain fabric density and specific volume.	**04**
	(c)	Derive and discussed cover factor of square jammed fabric.	**07**

Q.5 **(a)** Explain any two Tensile properties of fabric. **03**
      (b) Derive necessary equation of fabric model for Race-track cross-section. **04**
      (c) Derive all the equations related to fabric Porosity. **07**

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