

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (OLD) EXAMINATION – SUMMER 2019****Subject Code: 172905****Date: 21/05/2019****Subject Name: Fibre Science & Elements Of Textile Structure****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.

Q.1 (a) State the methods of investigation of fibre structure and explain the NMR & Infrared radiation technique. **07**

(b) Explain the role of moisture on fibre properties. Explain the terms: - Differential heat of sorption and Integral heat of sorption. **07**

Q.2 (a) Explain the terms:- Primary creep, Secondary creep and explain the viscoelastic behavior of fibres. **07**

(b) Explain idealized helical geometry of twisted yarn with neat sketch. What are the assumptions made in it? **07**

OR

(b) Discuss theory of crimp interchange. Calculate fractional cover of a monofilament nylon fabric having 70 ends/inch and 60 picks/inch woven with 150 x 150 Denier. **07**

Q.3 (a) Write a short note on density of fibre and any method of measuring the same. **07**

(b) Mention different models of micro fine structure of fibres and write on Paracrystalline model. **07**

OR

Q.3 (a) Explain the extension and recovery in the rayon fibres. **07**

(b) Write a short note on "Swelling in fibres". **07**

Q.4 (a) Explain Co-Axial and Idealised helix model. **07**

(b) Derive the relationship between Packing density and Rate of migration. **07**

OR

Q.4 (a) Derive equations for Contraction and Retraction in yarn with reference to surface twist angle. **07**

Q.4 (b) Derive the relationship between (a) Specific volume of yarn and Twist factor, (b) Discuss the disturbing factors in ideal packing of yarn. **07**

Q.5 With a neat sketch discuss the Peirce model for plain fabric. Discuss Fractional Cover and Total Cover. **14**

OR

Q.5 Discuss the special conditions of Peirce model for plain fabric when angle (ϕ) is small, when filling is straight and when fabric is jammed. **14**
