Registration No: | | | | | | | | | | | |

Total Number of Pages: 02   **B.Tech**
                                                              PTX3D001

3rd Semester Regular/Back Examination 2017-18
STRUCTURE & PROPERTIES OF FIBRES
BRANCH: TEXTILE
Time: 3 Hours
Max Marks: 100
Q.CODE: B1246

Answer Question No.1 and 2 which are compulsory and any four from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions:** *multiple type or dash fill up type*   **(2 x10)**
   a) The DP of textile grade Polyester is about_____, The DP of cotton is about _____.
   b) The crystallinity in cotton is about _____, where as in case of wool it is about ____.
   c) SEM investigates _____ of Fibres, and FTIR help in detection of _____.
   d) _____ has largest elasticity and _____ has highest initial modulus. (natural fibre)
   e) The wavelength of visible ray is from ____ to _____ nm.
   f) The L/D ratio of textile fibres should more than _____, ____ is the longest natural fibre.
   g) The moisture regain of PET is about _____ and that of wool is _____.
   h) Helical structure is found in case of _____, ____ fibre shows kidney shaped cross section.
   i) Alpha and Beta cortex is found in _____ fibre and _____ is the major component
   j) 1 gm/denier = _____N/Tex.

Q2   **Answer the following questions:** *Short answer type*   **(2 x 10)**
   a) What is Bragg's Law?
   b) What is the wavelength range of X-ray?
   c) What is the difference between stress and specific stress?
   d) What is work of rupture?
   e) What is the difference between addition and condensation polymerization.
   f) Name the monomers of cotton and nylon.
   g) What is the difference between Kevlar & Nomex ?
   h) What is the difference between thermosetting and thermoplastic polymer.
   i) What is yield point?
   j) What is the difference between elastic and plastic extension?

Q3 a) Define a textile fibre, what properties make them suitable for textile application, explain with examples.   **(10)**
   b) Classify the fibers with examples.   **(5)**

Q4 a) What is a polymer? How do we classify them according to various criteria, discuss with examples.   **(10)**
   b) How the functional groups in the monomers affect properties? Explain by taking example of Cotton and PET.   **(5)**

Q5 a) Discuss the morphological structure of cotton with neat diagram and some   **(10)**

important physical characteristic.

b) What do you mean by spectroscopy? Explain how the various ranges of wavelengths of light we use for probing fibre structure, functional groups and other information. **(5)**

Q6 **a)** Discuss various polymers in textile fibres. How the performance characteristics of various fibres reflected from the respective monomers and their arrangements. **(10)**

b) Discuss the fundamental principle behind FTIR analysis? **(5)**

Q7 **a)** Describe the principle and working of X-ray Diffraction. How crystalinity and orientation is inferred from X-ray diffraction studies. **(10)**

b) What kind of information's we get from stress –stain curve, discuss with examples? **(5)**

Q8 **a)** Describe the Principle and application of Scanning Electron microscope (SEM). **(10)**

b) What is glass transition temperature, what importance it has in textile processing? **(5)**

Q9 **a)** Discuss various techniques and its application for interpretation of thermal analysis like DTA, DSC & TGA **(10)**

b) What is birefringence? How is it useful to measure anisotropic properties? **(5)**