[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2063)

844

B.Tech 4th Semester Examination

Properties of Fibres

TE-4001

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : The question paper consists of five sections A, B, C, D and E. The candidates are required to attempt one question from each section A, B, C & D and all the subparts of the question in section E.

SECTION - A

1. What are the different models suggested by researchers to explain the microstructure of the fibres? Describe each of them. **(20)**

2. (a) Explain degree of order and degree of orientation.

   (b) Write a note on fundamental principle of x-ray diffraction. **(20)**

SECTION - B

3. Why do we use two different terms viz. moisture regain and moisture content to express moisture in textile fibres? Describe the Peirce's theory of moisture absorption. **(20)**

4. (a) How are moisture regain and moisture content important? Describe the relationship between the two.

   (b) Prove that $S_A = 2S_D + S_D^2$

   where, S_A = Transverse area swelling

   S_D = Transverse diameter swelling **(20)**

SECTION - C

5. (a) Discuss the factors influencing results of tensile testing.

   (b) What are the reasons behind the occurrence of 'crop' and 'stress' relaxation in a fibre?

6. Define bending and torsional rigidity. Explain the measurement of bending and tortional rigidity of a fibre. **(20)**

SECTION - D

7. Explain in detail the measurement of optical properties of a fibre. **(20)**

8. Write short notes on:

   (a) Effect of different parameters on dielectric properties.

   (b) Static electricity: Phenomenon and measurement. **(20)**

SECTION - E

9. (i) State the importance of dynamic testing.

(ii) How static charge is developed in a textile fibre?

(iii) Why the birefringence value of acrylic is negative?

(iv) What is the basic difference between relaxation modulus and creep modulus?

(v) What is difference between linear visco-elastic and a non-linear visco-elastic material?

(vi) What do you mean by primary and secondary creep?

(vii) Draw stress-strain curve of cotton and wool fibres.

(viii) What are moisture regain of nylon and polyester fibres?

(ix) Define breaking length.

(x) What is glass transition temperature? **(10×2=20)**