

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2064)

14650

B. Tech 4th Semester Examination

Properties of Fibres (N.S.)

TE-221

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 : Attempt five questions in all, selecting one question from each section. Section E contains only one question which is compulsory.

SECTION - A

1. (a) Discuss different models to explain the physical structure of a textile fibre. (10)
- (b) Explain the principle of SEM to analyse the physical structure of a fibre. (10)
2. (a) What is 'degree of order' and 'degree of orientation'? Mention its importance. (8)
- (b) What are different method of analysing chemical structure of a fibre? Explain the principle of IR spectroscopy to identify chemical structure of a fibre. (12)

SECTION - B

3. (a) Define relative humidity and moisture regain. Discuss the relation between these two. (8)

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- (b) Define swelling of a fibre. Discuss different form of swelling occur in a fibre. How these are measured. (12)
- 4. Explain the principle and method of measurement of fibre friction by static method. How load and area of contact affect the friction. (20)

SECTION - C

- 5. (a) Discuss the factors affecting the results of tensile testing. (6)
- (b) Define creep and stress relaxation. (4)
- (c) Explain the mechanical behaviour of fibre with the help of spring and dash pot placed in series alongwith the drawback of model. (10)
- 6. (a) Define different dielectric properties. Discuss the effect of temperature and humidity on dielectric properties. (14)
- (b) Define bending and torsional rigidity of a fibre. Discuss their importance. (6)

SECTION - D

- 7. (a) What structural changes occur in a fibre at glass transition temperature? (10)
- (b) Discuss the role of static charge in textile. Discuss the problem associated with static charge generation. (10)
- 8. (a) Define double refraction and refractive index ellipsoid. (6)
- (b) How the birefringence of a fibre is measured? (10)
- (c) Define reflection and lustre. (4)

SECTION - E

9. Briefly answer the following:
- (i) Define moisture content. How it is related to moisture regain?
 - (ii) What is hysteresis in moisture absorption?
 - (iii) Define Elastic Recovery.
 - (iv) Define static and kinetic frictions.
 - (v) What is primary and secondary creep?
 - (vi) Define glass transition temperature and melting temperature.
 - (vii) Mention the difference between IR and x-ray measurement.
 - (viii) What is weak link effect?
 - (ix) What is directional frictional effect?
 - (x) What is Dichroism? (10×2=20)