Register Number: ……..

B.TECH DEGREE EXAMINATIONS: JUNE/JULY 2013

Fifth Semester

TEXTILE TECHNOLOGY

TTX112**:** Structure and Properties of Textile Fibres

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The X-ray diffraction method is used to identify the _____ in the fibre.
   a) Crystallinity b) Chemical groups
   c) Molecular weight d) All the above three
2. Cystine linkages are present in _____ fibre.
   a) cotton b) wool
   c) silk d) nylon
3. The moisture regain % of silk fibre at standard relative humidity & temperature is
   a) 15 b) 10
   c) 25 d) 8
4. The dry weight of the cotton fabric is 10 g which absorbs 20% moisture of its own weight, the moisture content in the cotton fabric is _____.
   a) 10.7 b) 1.67
   c) 12.7 d) 16.7
5. Tenacity of the textile fibre can be expressed in
   a) Grams/tex b) grams
   c) Pounds/inch^2 d) pounds
6. Mechanical conditioning of textile fibre _____ the elastic recovery % near the breaking point.
   a) increases b) decreases
   c) not influences d) rapidly decreases
7. Optical orientation factor (f) for a perfectly oriented fibre is
   a) 0 b) 1
   c) infinity d) 100

8. _____ process improves the lustre of the cotton fibre.

a) bleaching b) scouring

c) mercerizing d) desizing

9. _____ fibre is more prone to static electricity during fibre processing.

a) Cotton b) Polyester

c) Viscose rayon d) Wool

10. _____ fibre is having higher thermal conductivity.

a) Cotton b) Wool

c) Polypropylene d) Nylon

PART B (10 x 2 = 20 Marks)

11. List the various basic requirements for fibre formation.
12. What is degree of order?
13. How do you calculate moisture content and moisture regain?
14. Mention the standard atmospheric conditions for performing the textile testing.
15. Draw the typical Load-Elongation curve of a textile fibre.
16. Define Flexural rigidity.
17. Why cotton has low birefringence value?
18. Define dichroism.
19. Define mass specific resistance.
20. With the help of diagram, show the influence of moisture content on electrical resistance of various fibres.

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain in detail the chemical and morphological structure of cotton fibre. (8)

(ii) Discuss the various patterns of natural and manmade fibres obtained from X-ray diffraction study. (6)

(OR)

b) (i) Explain in detail the gross structure of wool. (7)

(ii) Write a short note on Scanning Electron Microscopy (SEM). (7)

22. a) Explain in detail the relation between regain and relative humidity different fibres with the help of diagram. Also discuss the influence of temperature on absorption of fibres.

(OR)

b) Explain briefly the mechanism of conditioning of fibres with the help of diagram. Also discuss the changes in regain, temperature and vapour pressure of fibre during conditioning.

23. a) Explain in detail the stress – strain relations of various natural & synthetic fibres.

(OR)

b) Discuss in detail the elastic recovery of various textile fibres with the help of diagram.

24. a) (i) Explain briefly the measurement techniques of birefringence. (10)

(ii) Tabulate the refractive indices and birefringence value of various fibres. (4)

(OR)

b) Discuss elaborately on the reflection and lustre and various factors influencing it.

25. a) (i) Explain briefly the problems associated with the static electricity in the textile materials. (10)

(ii) Discuss the various factors influencing dielectric properties of fibres. (4)

(OR)

b) (i) Discuss the changes occurring in thermal transitions. (7)

(ii) Write a short note on heat setting. (7)

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