**[Total No. of Questions - 9] [Total No. of Printed Pages - 3] (2125)**

**15141**

**B. Tech 5th Semester Examination**

**Nonwoven and Non Conventional Fabric Manufacture (OS)**

**TE-5004**

**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 :** Candidates are required to attempt five questions in all selecting one question from each section A, B, C & D of the question paper and all the subparts of the questions in Section E.

**SECTION - A**

1. (a) Define Nonwoven fabrics. Classify the nonwoven fabrics according to their bonding method and compare the performance of various bonding techniques.

   (b) Explain the working of needle punching machine with a neat diagram. Also discuss the modification by Rontex. (10+10=20)

2. (a) Name the fibres which are used in the production of nonwoven fabrics. What properties of polyester fibre make it suitable for nonwovens.

   (b) Explain the tensile behaviour of needle punched nonwoven fabric. Discuss the effect of machine parameters on the tensile properties of fabric. (5+15=20)

**[P.T.O.]**



**SECTION - B**

3. (a) Explain various methods of dry web laying. How does fibre orientation in the web affect fabric properties?

   (b) Discuss the various types of dryers used in the production of chemical and thermal bonded fabrics. (10+10=20)

4. (a) Discuss various applications of nonwoven fabrics in the field of medical and geotextile.

   (b) Explain the methods of bonding agent application with the help of slop padding and screen printing. Discuss the factors that affect the amount of bonding agent application. (10+10=20)

**SECTION - C**

5. Explain different phases of weft insertion in a projectile weaving machine. (20)

6. Describe the methods to drive the rapier looms. (20)

**SECTION - D**

7. (a) Explain the concept of multiphase weaving. Discuss the shedding mechanism in warp way and weft way multiphase loom.

   (b) Discuss the differences between water jet and air jet weaving machines. (15+5=20)

8. (a) Describe the mechanism of weft insertion in a narrow fabric loom.

   (b) Discuss the loom timing for air jet weaving. (10+10=20)

## SECTION - E

9. (a) What factors prompted the development of nonwoven fabrics in the recent past?

(b) What do you understand by SM & SMS fabrics? Where are they used?

(c) What special properties are required in the fibres, for being used in wet laying method?

(d) Differentiate between partial bonding and gradual bonding.

(e) How adhesive fibres and bicomponent fibres are used in nonwoven fabric manufacture?

(f) Elaborate the problems of shuttle looms

(g) What are the advantages of projectile loom?

(h) Mention the design of wilton carpets and their use.

(i) What is the function of relay jets in air jet weaving?

(j) Give the classification of rapier looms. (2×10=20)