

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2023****Subject Code:3152909****Date:15-12-2023****Subject Name:Fabric Formation III****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define and give the brief classification of nonwoven fabric. **03**
(b) Discuss in detail techno-economics of air-jet looms over ordinary plain power loom and automatic shuttle looms. **04**
(c) Describe the needle punching technique for producing non-wovens. What are the latest developments in needle punching? **07**

- Q.2** (a) Explain different methods of classifying rapier looms. **03**
(b) State the importance of selvages. Also mention different types of selvages formed on shuttleless looms. **04**
(c) With the help of neat diagram, explain beat up mechanism of Sulzer projectile loom. **07**

OR

- (c) State the importance of weft measuring system used in shuttleless loom and explain the same with the help of neat diagram. **07**

- Q.3** (a) State the objects of weft tensioning devices mounted on shuttleless looms. **03**
(b) Calculate weft insertion rate of Air Jet loom in metres/minute if its speed is 1200 rpm and width of loom is 190 centimeter. Also, calculate the production of machine in metres/shift of 8 hours if 48 picks are inserted per inch of fabric at 95 % efficiency. **04**
(c) Explain construction and working of the torsion bar picking mechanism of Sulzer projectile loom with suitable diagram. **07**

OR

- Q.3** (a) Discuss merits and demerits of water-jet weaving machine. **03**
(b) Explain different phases of weft insertion in case of water jet loom with the help of neat diagram. **04**
(c) With the help of neat diagram, explain the principles of weft insertion of Air Jet loom. **07**

- Q.4** (a) Discuss the scope of rapier looms in filter fabric weaving. Which type of rapier loom is most suitable for filter fabric weaving and why? **03**
(b) Describe the cloth take up mechanism found in any latest rapier loom. **04**
(c) With the help of neat diagram, explain double repair tip transfer type of weft insertion system. **07**

OR

- Q.4** (a) Show the different parts of a needle commonly used in needle punching machine. **03**
(b) Discuss the scopes and growth rate of non-woven industry and write down the names of the end uses where non-wovens can be used. **04**
(c) What are parallel laid, cross laid, random laid and vertical laid webs? Describe one technique for producing random laid web. **07**

- Q.5 (a)** What is 3D woven fabric? State advantages of 3D woven fabric in technical textile. **03**
- (b)** State application of adhesive fibres and bicomponent fibres. **04**
- (c)** Discuss, in detail, the principle of working of Braiding machine. **07**
- OR**
- Q.5 (a)** State some of the applications of narrow woven fabrics. **03**
- (b)** Explain briefly about leno weaving. **04**
- (c)** What are spun bonded and split film fabrics? Describe the process of making spun bonded fabrics. **07**
