

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 3172312

Date: 01/06/2026

Subject Name: Fiber Reinforced Plastics and Composites

Time: 02:30 PM TO 05:00 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)** List three advantages of FRP compared to traditional materials like steel or aluminum. **03**
 - (b)** Explain the different roles of resin and reinforcements in a composite material. **04**
 - (c)** Illustrate the sequence of actions required to successfully construct a basic Fiber-Reinforced Polymer (FRP) part using the Hand Lay-up process with neat diagram. **07**

- Q.2**
- (a)** List advantages and limitations of Hand lay-up process. **03**
 - (b)** Describe preparation of epoxy resin mold using single stage casting. **04**
 - (c)** Illustrate the steps involved in Resin Injection Molding technique, and write the main advantages that make this method superior to simpler composite manufacturing processes. **07**

OR

- Q.2**
- (c)** Explain the Spray lay-up process and give its advantages and disadvantages. **07**
- Q.3**
- (a)** List any three natural fibers and synthetic fibers used as reinforcements in composites. **03**
 - (b)** Explain manufacturing of Glass fiber with neat diagram. **04**
 - (c)** Discuss the principle and typical applications of the Pultrusion process. Draw a schematic diagram of the process. **07**

OR

- Q.3**
- (a)** List types of accelerators used in unsaturated polyester resin. **03**
 - (b)** Describe the purpose of a Gelcoat/top coat resin in FRP manufacturing. **04**
 - (c)** Which precursors are used in preparation of Carbon fiber? Explain manufacturing of Carbon fiber with flow diagram. **07**

- Q.4**
- (a)** List the various forms and types of Glass fiber used as reinforcement. **03**
 - (b)** List and discuss factors to be considered for material selection criteria in designing of FRP product. **04**
 - (c)** Write the sequence of the process from raw materials to a ready-to-mold sheet from Sheet molding compounding (SMC) with neat diagram. **07**

OR

- Q.4**
- (a)** State the specific types of Catalysts used for curing unsaturated polyester resins. **03**
 - (b)** Describe the preparation and characteristics of Dough and bulk molding compounds (DMC/BMC). **04**

	(c) Outline the Manufacture of Wood-Polymer Composite (WPC) Products and discuss two main Applications of WPC Products.	07
Q.5	(a) Give properties and applications of Aramid fibers.	03
	(b) List the types of glycols, saturated acids, unsaturated acids and monomers used in preparation of unsaturated polyester resin	04
	(c) Explain with neat diagram Vacuum bag molding process along with its advantages.	07
	OR	
Q.5	(a) List three major applications of FRP.	03
	(b) Give properties and applications of Carbon fibers.	04
	(c) Describe filament winding process along with its winding pattern and applications.	07
