

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3162112****Date:01-06-2026****Subject Name: Composite materials****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.

		MARKS
Q.1	(a) Where are composite materials commonly used in modern technology and daily life?	03
	(b) Give applications of composites in automobile and aerospace sectors.	04
	(c) How are composite materials categorized based on the type of reinforcements used in them?	07
Q.2	(a) Why matrix in composite material are important?	03
	(b) Define fibrous composites and provide real-world examples.	04
	(c) Write a short note on structural composites.	07
	OR	
	(c) Explain in detail: Sandwiched panel composites.	07
Q.3	(a) Give examples of laminated composites.	03
	(b) What is the critical fiber length in composites? Provide an explanation and the related formula.	04
	(c) How do the properties of ceramic matrix composites differ from metal matrix composites?	07
	OR	
Q.3	(a) List the benefits of polymer matrix composites.	03
	(b) How does the orientation and shape of fibers influence the properties of a composite?	04
	(c) Write a note on interfaces in composites.	07
Q.4	(a) Write applications of aramid fiber reinforced polymers.	03
	(b) What characteristics make materials suitable as matrix and reinforcing materials in composites?	04
	(c) Write a short note on Ceramic Matrix Composites.	07
	OR	
Q.4	(a) Define C-C composites and give applications of C-C composites	03
	(b) What are matrix and reinforcement materials in cermets? List their applications.	04
	(c) Explain the PAN process used for manufacturing carbon fibers.	07
Q.5	(a) Write applications of Glass Fiber Reinforced Polymers.	03
	(b) Write a short note on smart composites.	04
	(c) A continuous and aligned carbon fiber-reinforced composite consists of 30 vol% of fibers having a modulus of elasticity of 80 GPa and a polyester resin that, when hardened, displays a modulus of 8 GPa, compute the modulus of elasticity of this composite in the transverse direction.	07

OR

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| Q.5 | (a) | Explain different wetting conditions. | 03 |
| | (b) | Explain how crack can be arrested by fibers in composites? | 04 |
| | (c) | Derive rule of mixture representing modulus of elasticity of a composite in loading direction perpendicular to fiber alignment. | 07 |
