Enrolment No./ Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER – I (OLD) EXAMINATION – SUMMER - 2025

Subject Code: 3712806 **Date: 31 May 2025**

Subject Name: Advance Material Technology

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.**

Q.1	**(a)**	Explain a crystallographic defect "Dislocation" in brief with types.	**07**
	(b)	Describe the effect of temperature, strain and strain rate on plastic behavior of materials.	**07**
Q.2	**(a)**	Explain Griffith theory of fracture of materials.	**07**
	(b)	Explain factors affecting selection of materials for engineering purposes.	**07**
		OR	
	(b)	List various strengthening mechanisms. Explain work hardening.	**07**
Q.3	**(a)**	Mention properties and application of High strength low alloy (HSLA) steel.	**07**
	(b)	Describe the Larsen Miller parameter for predicting the material service life.	**07**
		OR	
Q.3	**(a)**	What are the properties and application of bio materials?	**07**
	(b)	Explain the factors to be considered for selecting material for aviation and nuclear application.	**07**
Q.4	**(a)**	Give short note on Paris law.	**07**
	(b)	Discuss processing and application of CBN based ceramic material.	**07**
		OR	
Q.4	**(a)**	Explain characteristics and applications of engineering polymers.	**07**
	(b)	Give short note on Dual-phase steel.	**07**
Q.5	**(a)**	Briefly explain particle reinforced composites and fiber reinforced composites with their characteristics.	**07**
	(b)	Explain and briefly classify the term composite materials.	**07**
		OR	
Q.5	**(a)**	Give advantageous application of composite material in details.	**07**
	(b)	Enlist various testing of composite materials. Explain any one.	**07**

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