Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015

Subject Code: 2152109 **Date:14/12/ 2015**

Subject Name: Advanced Materials

Time:10:30am to 1:00pm **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)**	Discuss important characteristics of Aluminum that makes it attractive for engineering applications.	**07**
	(b)	Give the classification, properties and applications of Fe-based super-alloys.	**07**
Q.2	**(a)**	What do you mean by alloy cast Iron? Give the composition, properties and applications of High silicon cast iron.	**07**
	(b)	Define composite. Discuss properties & applications of ceramic matrix composites	**07**
		OR	
	(b)	What is stainless steel? Which are important properties of stainless steel? Compare Austenitic S.S. and Martensitic S.S.	**07**
Q.3	**(a)**	Define amorphous alloys. Compare it with crystalline alloys. Discuss the copper mold casting technique to produce the metallic glasses.	**07**
	(b)	Give the classification of bio-materials. Describe properties and application of Ni-Ti alloy as a useful bio-material.	**07**
		OR	
Q.3	**(a)**	Compare Electro-rheological fluid and Magneto-rheological fluid	**07**
	(b)	Define Smart Materials. Write a note on shape memory alloys.	**07**
Q.4	**(a)**	Define superconductivity. Describe properties and applications of superconductors.	**07**
	(b)	Define biocompatibility. Discuss properties and application of Co-Cr-Mo alloys as a bio-material.	**07**
		OR	
Q.4	**(a)**	Write properties and application of Titanium and its alloys	**07**
	(b)	Short note on Cryogenic materials.	**07**
Q.5	**(a)**	Explain the Heat treatment cycle for Maraging steel. Give properties and applications of maraging steel.	**07**
	(b)	Describe the requirements of aero-space materials. Enlist some candidate materials.	**07**
Q.5	(a)	What is Nano material? Write note on carbon Nano tube.	**07**
	(b)	What are shape memory alloys? Write properties and applications.	**07**

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