Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 710808N **Date: 06-01-2014**

Subject Name: Material Science & Material

Time: 10.30 am – 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.**

Q.1	**(a)**	Explain the factors to be considered for selecting materials for engineering application.	**07**
	(b)	Define (i) Atomic number (ii) Mass number (iii) Atomic Packing Factor (iv) Berger vector diagram and (v) Screw dislocations	**07**
Q.2	**(a)**	Define the term "Thermal properties" and derive the relationship between specific heats.	**07**
	(b)	State the assumption made in Einstein classical model and also state what modification Debye has made in his specific heat theory.	**07**
		OR	
	(b)	State and justify the assumptions made in theory of elasticity	**07**
Q.3	**(a)**	What do you mean by Smart material? Discuss about the engineering applications of Smart material.	**07**
	(b)	Explain in detail the effect of temperature on properties of materials.	**07**
		OR	
Q.3	**(a)**	What are the types of Fractures in Metals? Discuss in detail the Ductile fracture.	**07**
	(b)	Explain effects of service condition on the performance of materials.	**07**
Q.4	**(a)**	Write short note on super alloys.	**07**
	(b)	Write a note on S-N curve.	**07**
		OR	
Q.4	**(a)**	State the favourable aspects of composite material and explain its classification	**07**
	(b)	Explain principle & process of X-ray radiography.	**07**
Q.5	**(a)**	State in brief about factors to be considered in deciding of safe working stress.	**07**
	(b)	(i) Discuss in detail the Wiedemann Franz ratio. (ii) What is the role of computer in metal processing?	**07**
		OR	
Q.5	**(a)**	Give your thoughts on Radiation damage in materials and how damages are to be recovered.	**07**
	(b)	State the important aspects of dielectric materials in context with the engineering application.	**07**

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