Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 131904 **Date: 07/06/2017**

Subject Name: Material Science and Metallurgy

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.**

Q.1	**(a)**	(1) Give difference between metals and non metals. (2) Define (i) Creep (ii) Malleability (iii) Hardness	**07**
	(b)	Which are advantages and limitations of powder metallurgy?	**07**
Q.2	**(a)**	What is non destructive test? List various non destructive tests?	**07**
	(b)	Explain selection criteria for engineering materials.	**07**
		OR	
	(b)	List properties of wrought iron and cast iron.	**07**
Q.3	**(a)**	(1) Define allotropy. Explain allotropy of iron. (2)Draw iron carbon equilibrium diagram.	**07**
	(b)	Give composition, properties and uses of malleable cast iron.	**07**
		OR	
Q.3	**(a)**	Draw with neat sketch of metallurgical microscope. Explain its construction.	**07**
	(b)	What is solid solution? Explain types of solid solution. Also give Hume Rothery's rules.	**07**
Q.4	**(a)**	Give compositions, properties and uses of Y alloy.	**07**
	(b)	What is cathodic protection?	**07**
		OR	
Q.4	**(a)**	What are the purposes of alloying? Give effects of Nickel as an alloying element.	**07**
	(b)	Give composition and uses of Monel metal and Nichrome.	**07**
Q.5	**(a)**	Explain ultrasonic testing with advantages and limitations.	**07**
	(b)	Which are various surface Hardening processes? Explain induction Hardening process with sketch.	**07**
		OR	
Q.5	**(a)**	Explain any two methods for production of metal powders.	**07**
	(b)	(1) Which are the objective of heat treatment? (2) Give difference between Annealing and Normalizing.	**07**

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