Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2014

Subject Code: 172104 **Date: 29-05-2014**

Subject Name: Alloy Design

Time: 02:30 pm - 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)**	Define composite material and explain metal matrix composites with example.	**07**
	(b)	Discuss the size, shape and distribution of second phase on mechanical properties of alloys.	**07**
Q.2	**(a)**	What is dual phase steel? Discuss them.	**07**
	(b)	With neat sketch discuss the effect of recovery, recrystallizaton and grain growth on mechanical properties.	**07**
		OR	
	(b)	Define Creep. With Creep curve explain creep mechanism.	**07**
Q.3	**(a)**	Draw and explain the variation in cooling behavior of pure metal, solid solution and eutectic alloys.	**07**
	(b)	What is fatigue? Explain phenomena of fatigue.	**07**
		OR	
Q.3	**(a)**	With diagrams explain continuous and discontinuous fiber alignment and state its effects on properties.	**07**
	(b)	Explain single, dual and multi phase materials.	**07**
Q.4	**(a)**	Discuss the points to be taken into account while selecting materials for static structure.	**07**
	(b)	Discuss margaging and hadfield steel.	**07**
		OR	
Q.4	**(a)**	Explain the activities involved in engineering design.	**07**
	(b)	What are the objectives of design of experiment? Explain the basic terms related to it.	**07**
Q.5	**(a)**	Define lubricant and discuss how it affects the wear behavior of materials.	**07**
	(b)	Discuss the effect of elements on various types of super alloys.	**07**
		OR	
Q.5	**(a)**	Write note on high strength low alloy steel.	**07**
	(b)	Explain M-high speed steel with effect of alloying elements on its properties.	**07**

****