Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2016

Subject Code:172104 **Date:18/05/2016**

Subject Name:Alloy Design

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)**	With neat graph show the temperature versus time behavior for pure metal, solid solution and eutectic alloys.	**07**
	(b)	Discuss how mechanical properties vary in recovery, recrystallizaton and grain growth processes.	**07**
Q.2	**(a)**	Explain the activities involved in engineering design.	**07**
	(b)	Discuss criteria for selecting materials for static structure.	**07**
		OR	
	(b)	What do you mean by single, dual and multi phase materials? With suitable examples discuss them.	**07**
Q.3	**(a)**	What is meant by creep? Explain creep mechanism with creep curve.	**07**
	(b)	Write a short note on Hadfield Steel.	**07**
		OR	
Q.3	**(a)**	Define and classify composite materials and compare metal and ceramic matrix composites with example.	**07**
	(b)	What is High Speed Steel? Give its classification of high speed steels and compare them.	**07**
Q.4	**(a)**	What is lubricant? Explain effects of lubrication on wear behavior of materials.	**07**
	(b)	How mechanical properties of an alloy are manipulated by size, shape and distribution of second phase?	**07**
		OR	
Q.4	**(a)**	What are super alloys? List different types and give their applications.	**07**
	(b)	What is a failure phenomenon under cyclic loading of material is known as? Discuss it with neat curve.	**07**
Q.5	**(a)**	Classify high strength low alloy steels and give their properties and applications.	**07**
	(b)	Explain the basic terms related to design of experiment and enlist its objectives of design of experiment.	**07**
		OR	
Q.5	**(a)**	Define and Draw microstructure of dual phase steels. Also give its applications and compare it with plain carbon steel.	**07**
	(b)	Discuss the effect of fiber alignment on property of material with diagrams.	**07**

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