GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII • EXAMINATION – WINTER • 2014

Subject Code: 172104   **Date: 27-11-2014**
Subject Name: Alloy Design
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)**	With diagrams explain continuous and discontinuous fiber alignment stating their effects on properties.	**07**
	(b)	Briefly explain single, dual and multi phase materials.	**07**
Q.2	**(a)**	Write a short note on dual phase steels.	**07**
	(b)	Discuss the effect of elements on various types of super alloys.	**07**
		OR	
	(b)	Explain the activities involved in engineering design.	**07**
Q.3	**(a)**	What is lubricant? Give its example and explain its' effects on wear behavior of materials?	**07**
	(b)	What are the objectives of design of experiment? Explain the basic terms related to it.	**07**
		OR	
Q.3	**(a)**	Define composite material and explain metal matrix composites with example.	**07**
	(b)	Discuss the effects on mechanical properties of alloys by size, shape and distribution of second phase?	**07**
Q.4	**(a)**	Draw neat sketch of creep curve and explain creep mechanism.	**07**
	(b)	Give classification of high speed steels. Compare group H and group M high speed steels.	**07**
		OR	
Q.4	**(a)**	Discuss criteria for selecting materials for static structure.	**07**
	(b)	Draw neat sketch of fatigue curve and explain it.	**07**
Q.5	**(a)**	Classify high strength low alloy steels and list their applications.	**07**
	(b)	Explain M-high speed steel with effect of alloying elements on its properties.	**07**
		OR	
Q.5	**(a)**	With neat sketch discuss the effect of recovery, recrystallizaton and grain growth on mechanical properties.	**07**
	(b)	Draw and explain the variation in cooling behavior of pure metal, solid solution and eutectic alloys.	**07**

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