

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE SEM-VII Examination-Nov/Dec.-2011**

**Subject code: 172104**

**Date: 26/11/2011**

**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) Define composite material and explain ceramic matrix composites with example. **07**  
(b) How mechanical properties of alloys are affected by size, shape and distribution of second phase? **07**

- Q.2** (a) With neat sketch discuss the effect of recovery, recrystallization 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**

**OR**

- (b) Write a short note on dual phase steels. **07**

- Q.3** (a) Explain creep mechanism using creep curve. **07**  
(b) Explain wear with tribological and design parameters. **07**

**OR**

- Q.3** (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**

- 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**

**OR**

- Q.4** (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.5** (a) Discuss the points to be taken into account while selecting materials for static structure. **07**  
(b) Give classification of high speed steels. Compare group H and group M high speed steels. **07**

**OR**

- Q.5** (a) What is lubricant? How it affects the wear behavior of materials? **07**  
(b) Discuss the effect of elements on various types of super alloys. **07**

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