

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER 2013****Subject Code: 172104****Date: 28-11-2013****Subject Name: Alloy Design****Time: 10:30 TO 01:00****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) Discuss Engineering design activities. Explain steps in alloy design. **07**
(b) Explain briefly single phase, dual phase and multiphase materials. **07**
- Q.2** (a) What is composite material? What is matrix? What is dispersed phase? Explain with example. **07**
(b) With figure explain continuous and discontinuous alignment of fibers in composite materials. **07**
- OR**
- (b) Discuss classification of composite materials. **07**
- Q.3** (a) Explain effects of size, shape and distribution of second phase on mechanical properties of composite materials. **07**
(b) Explain precipitation hardening in Al-4.5 % Cu alloy. **07**
- OR**
- Q.3** (a) Briefly discuss recovery, Recrystallization and grain growth. **07**
(b) Discuss strain hardening. **07**
- Q.4** (a) Explain homogeneous and heterogeneous nucleation. **07**
(b) Draw and explain S-N curve for steel and aluminium alloy. What is fatigue limit. **07**
- OR**
- Q.4** (a) Draw and explain creep curve. Explain its importance in design. **07**
(b) What are High Strength Low Alloy (HSLA) steels? Write their classification and explain. **07**
- Q.5** (a) Discuss briefly High Speed steels and discuss their applications. **07**
(b) Discuss the advantages of high strength aluminium powder metallurgical alloys. **07**
- OR**
- Q.5** (a) What is maraging steel? Discuss their properties and applications. **07**
(b) Briefly discuss superalloys. **07**
