

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014

Subject code: 2712806**Date: 09-01-2015****Subject Name: Advanced Material Technology****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) Explain the fracture behavior of engineering materials **07**
(b) What are the types of fracture in metals? Discuss in detail the ductile fracture. **07**
- Q.2** (a) Explain mechanism of solid solution hardening. Explain factors affecting solid solution hardening. **07**
(b) What is work hardening? Explain various stages of work hardening. **07**
- OR**
- (b) Explain Griffith's criterion for material failure. Explain stress intensity factor. **07**
- Q.3** (a) Enlist some smart materials with its characteristics. Explain applications of smart materials in engineering. **07**
(b) Explain in detail the effect of temperature on properties of materials. **07**
- OR**
- Q.3** (a) Explain the factors to be considered for selecting material for aviation, automobile and nuclear application. **07**
(b) Explain fatigue limit with diagram for various metals. Explain fatigue test. **07**
- Q.4** (a) Justify development of advanced materials. How ceramic materials are processed? **07**
(b) Explain constituents, advantages and applications of high strength low alloy steel. **07**
- OR**
- Q.4** (a) Explain characteristics and applications of engineering polymers. **07**
(b) Discuss trends in development of bio materials and its characterization. **07**
- Q.5** (a) How composite materials is better than convention material. Justify it. **07**
(b) Classify composite materials. Explain any one production technique of composite material. **07**
- OR**
- Q.5** (a) Define the term composite materials. Explain properties and application of composite materials. **07**
(b) How tensile test of composites is performed? **07**
