

GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER–I(New course)• EXAMINATION – WINTER- 2015

Subject Code: 2712806**Date: 02/01/2016****Subject Name: Advanced Material Technology****Time:2:30 pm to 5:00 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 different types of plastic deformation mechanism in crystalline materials. **07**
- (b) Describe the effect of temperature, strain and strain rate on plastic behavior of materials. **07**
- Q.2** (a) Explain factors affecting selection of materials for any product. What is relationship between material selection and processing? **07**
- (b) Explain Griffith theory of fracture of materials. **07**
- OR**
- (b) What is work hardening? Explain various stages of work hardening. **07**
- Q.3** (a) What is fatigue of a material? Explain low and high cycle fatigue test. **07**
- (b) Explain properties and applications of ceramics. **07**
- OR**
- Q.3** (a) Explain various toughening mechanisms to resist fracture? **07**
- (b) Explain characteristics of engineering polymers. Classify polymers in details. **07**
- Q.4** (a) Explain properties and applications of high strength low alloy steel. **07**
- (b) Define bio materials. Explain its application in various fields. **07**
- OR**
- Q.4** (a) Define smart materials. Explain various applications of smart materials. **07**
- (b) Define dual phase steel. Explain advantages and applications of dual phase steel. **07**
- Q.5** (a) Define major constituents of composite materials. Explain applications of composite materials. **07**
- (b) Explain any one mechanical testing of composite materials. **07**
- OR**
- Q.5** (a) Define composite materials. Compare composite materials with conventional materials. **07**
- (b) Write production techniques of metal matrix composites. Explain any one. **07**
