

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (OLD) EXAMINATION – WINTER 2017****Subject Code:132101****Date:29/11/2017****Subject Name: Elements of Metallurgy and Material Science****Time: 10:30 AM to 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)** Give a brief Classification of engineering materials and explain Engineering requirements of materials **03 +04**

**(b)** Give the Criteria for selection of materials for engineering applications **07**

**Q.2 (a)** What do you mean by deformation? Differentiate in Elastic and Plastic Deformation. **03 +04**

**(b)** Discuss structure, property & Application relationship in Engineering Materials with suitable example **07**

**OR**

**(b)** What is imperfection? Discuss different crystals imperfections in metallic material in brief **02 +05**

**Q.3 (a)** Define and explain: (1) Creep (2) Resilience (3) Hardness **02+03+02**

**(b)** Define metallurgy. Describe Various fields of metallurgy **07**

**OR**

**Q.3 (a)** What is composite? Explain comparison between metal matrix and ceramic matrix composite. **07**

**(b)** What is a foundry? List the advantages of casting process over other fabrication processes. Draw a flow chart showing major foundry activities **03+04**

**Q.4 (a)** What are polymers? Discuss the different Polymerization mechanisms with sketch **07**

**(b)** Write a short note on Piezoelectric materials **07**



- Q.4** (a) List various types of Corrosion? Explain the Principle and Suggest various methods to prevent it. **04+03**
- (b) Differentiate between cold working and hot working **07**
- Q.5** (a) What is difference between Destructive & Non-destructive testing? Explain Magnetic Particle Inspection Technique. **07**
- (b) What are the ceramic materials? Write short note on Traditional ceramic and Modern ceramic materials. **07**
- OR**
- Q.5** (a) What is powder metallurgy? Write advantage and limitations and applications of powder metallurgy. **03 +04**
- (b) Explain the Principle difference between welding, Brazing and soldering **07**

