

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**DIPLOMA ENGINEERING – SEMESTER – III• EXAMINATION – SUMMER 2016**

**Subject Code: 3335503****Date: 17/05/2016****Subject Name: Materials & Metallurgy****Time: 02:30 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.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

- Q.1** (a) Classify the engineering materials in chart form. **07**  
(b) Explain chemical composition, properties and application of Gray Cast Iron. **07**
- Q.2** (a) Define the term “Steel”. Explain classification of steel. **07**  
(b) Explain different factors affecting selection of materials for engineering purpose. **07**
- OR
- (b) Explain effect of different alloying element on properties of steel. **07**
- Q.3** (a) Explain different material and their requirement for high temperature service. **07**  
Write applications where high temperature service material required.  
(b) Compare ferrous and non ferrous metal. **07**
- OR
- Q.3** (a) Explain properties and application of Aluminum. **07**  
(b) Compare thermosetting plastic and thermoplastic plastic. **07**
- Q.4** (a) Define the term “Solid Solution”. Explain different types of solid solution with neat sketch. **07**  
(b) Draw neat sketch of IC diagram and write three important reactions. **07**
- OR
- Q.4** (a) Explain BCC, FCC and HCP crystal structure of metal with neat sketch. **07**  
(b) Draw neat sketch of TTT diagram. **07**
- Q.5** (a) Define the “heat treatment process”, classify it and explain purpose of heat treatment. **07**  
(b) Write properties and applications of ceramic material. **07**
- OR
- Q.5** (a) Explain hardening by quenching process in brief. **07**  
(b) Write brief note on ASME Sec-2. **07**

\*\*\*\*\*