

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**DIPLOMA ENGINEERING – SEMESTER – III • EXAMINATION – SUMMER- 2017**

**Subject Code: 3335503****Date: 01-05 -2017****Subject Name: Material & Metallurgy****Time: 02:30 PM TO 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.
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) List different mechanical properties of material and explain any five properties **07**  
(b) What is alloy steel? Explain advantage and limitation of alloy steel. **07**
- Q.2** (a) Explain effect of different alloying element on properties of steel. **07**  
(b) Explain different factors affecting selection of materials for engineering purpose **07**
- OR
- (b) Write brief note on H.S.L.A. steel. **07**
- Q.3** (a) What is Brasses? List different brasses and explain chemical composition, properties and application of any two. **07**  
(b) Explain properties and application of Aluminum. **07**
- OR
- Q.3** (a) Explain different material and their requirement for high temperature service. Write applications where high temperature service material required. **07**  
(b) Write properties and application of Glass. **07**
- Q.4** (a) Explain SC, BCC, FCC, HCP crystal structure of metal with neat sketch **07**  
(b) Define the term “Solid Solution” .Explain different types of solid solution with neat sketch. **07**
- OR
- Q.4** (a) Draw neat sketch of IC diagram and write three important reactions. **07**  
(b) Draw neat sketch of TTT diagram. **07**
- Q.5** (a) List different micro constituents of iron and explain them in brief. **07**  
(b) Explain metallurgical microscope with neat sketch. **07**
- OR
- Q.5** (a) Define the “heat treatment process”, classify it and explain purpose of heat treatment. **07**  
(b) Explain Material Test Certificate (MTC) with neat sketch **07**

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