

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (New) EXAMINATION – WINTER 2018****Subject Code: 2133403****Date: 01/12/2018****Subject Name: Engineering Materials and Metallurgy****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) Name Different Case Hardening Techniques. **03**
(b) Explain and draw cooling curves for 1) pure metal and **04**
2) Binary solid solution.
(c) What is Solid Solution? Explain its Types. **07**
- Q.2** (a) Classify Different Types of Steels. **03**
(b) Explain principle, methods and advantages of flame hardening. **04**
(c) What do you mean by Iron Carbon Equilibrium Diagram? Draw Line **07**
Diagram of Iron Carbon Equilibrium diagram and explain peritectic reaction.
- OR**
- (c) Draw and Explain TTT Diagram. **07**
- Q.3** (a) Define full annealing. Explain purposes of full annealing. **03**
(b) Explain Normalizing of Steel **04**
(c) Explain Copper alloys. **07**
- OR**
- Q.3** (a) Write applications of nickel and its alloys. **03**
(b) Differentiate thermoplastic and Thermosetting Plastic. **04**
(c) Write a short note on Bio-Degradable Plastics. **07**
- Q.4** (a) Write applications of aluminium and its alloys. **03**
(b) Classify steel and cast iron. **04**
(c) What are purposes of heat treatment? Classify heat treatment. **07**
- OR**
- Q.4** (a) Write characteristics of ceramics. **03**
(b) Explain Various Titanium Alloys and their applications. **04**
(c) Explain principles of heat treatment. What are stages of heat treatment? **07**
- Q.5** (a) Explain Plasma Nitriding Process. **03**
(b) Write a short note on composites. **04**
(c) Explain Tension Test on Materials. **07**
- OR**
- Q.5** (a) Explain Vacuum Hardening Process. **03**
(b) Explain Carburizing Process. **04**
(c) Explain Impact Test on Materials. **07**
