

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III(OLD) EXAMINATION – SUMMER 2019****Subject Code: 131904****Date: 11/06/2019****Subject Name: Material Science And 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.

- Q.1** (a) Briefly explain various properties of engineering materials. **07**
(b) Draw Iron-Iron carbide equilibrium diagram. Name all the important reactions, phases, percentages and temperatures on the diagram. **07**
- Q.2** (a) What is a solid solution? Explain different types of solid solution with a neat sketch. **07**
(b) What are the three common methods of powder production in powder metallurgy? Explain any one in detail. **07**
- OR**
- (b) What are the advantages and disadvantages of powder metallurgy? **07**
- Q.3** (a) Classify various types of cast irons and explain briefly about grey cast iron. **07**
(b) State composition, specific properties and applications of White Cast Iron. **07**
- OR**
- Q.3** (a) State composition, specific properties and applications of high carbon steels. **07**
(b) What is allotropy? Discuss the allotropy of iron. **07**
- Q.4** (a) Draw TTT diagram for eutectoid steel. Explain it briefly by considering few cooling rates. **07**
(b) Explain induction hardening process with the help of a neat sketch. **07**
- OR**
- Q.4** (a) Define heat treatment. Compare annealing and normalizing process. **07**
(b) Explain in detail pack carburizing process with the help of a neat sketch. **07**
- Q.5** (a) Write a short note on copper and its alloys **07**
(b) Define corrosion and explain different types of corrosion. **07**
- OR**
- Q.5** (a) Explain with a neat sketch procedure followed during Dye Penetrant Test. **07**
(b) Explain the criteria for selection of materials for engineering applications. **07**
