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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** Briefly explain various properties of engineering materials. 07 (a) **(b)** Draw Iron-Iron carbide equilibrium diagram. Name all the important reactions, 07 phases, percentages and temperatures on the diagram. What is a solid solution? Explain different types of solid solution with a neat sketch. Q.2 07 (a) **(b)** What are the three common methods of powder production in powder 07 metallurgy? Explain any one in detail. What are the advantages and disadvantages of powder metallurgy? 07 **(b) Q.3 (a)** Classify various types of cast irons and explain briefly about grey cast iron. 07 State composition, specific properties and applications of White Cast Iron. 07 **(b)** OR 0.3 State composition, specific properties and applications of high carbon steels. 07 **(a)** What is allotropy? Discuss the allotropy of iron. 07 **(b)** Draw TTT diagram for eutectoid steel. Explain it briefly by considering few **Q.4** 07 **(a)** cooling rates. Explain induction hardening process with the help of a neat sketch. 07 **(b)** OR Define heat treatment. Compare annealing and normalizing process. **Q.4 (a)** 07 **(b)** Explain in detail pack carburizing process with the help of a neat sketch. 07 Q.5 Write a short note on copper and its alloys 07 **(a)** Define corrosion and explain different types of corrosion. 07 **(b)** OR Explain with a neat sketch procedure followed during Dye Penetrant Test. Q.5 07 **(a)** Explain the criteria for selection of materials for engineering applications. 07 **(b)**
