

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER-III • EXAMINATION – SUMMER • 2014

Subject Code: X 31902**Date: 20-06-2014****Subject Name: Material Science and Metallurgy****Time: 02:30 pm – 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) Explain any two methods for production of metal powders **07**
(b) (1) Which are the objectives of heat treatment? **07**
(2) Give difference between annealing and normalizing.
- Q.2** (a) Explain ultrasonic testing with advantages and limitations. **07**
(b) Which are various surface hardening processes? Explain Induction hardening process with sketch. **07**
- OR**
- (b) Explain selection criteria for engineering materials. **07**
- Q.3** (a) (1) Give difference between metals and non metals. **07**
(2) Define (i) Creep (ii) Malleability (iii) Hardness
(b) List the properties of wrought iron and applications of wrought iron and limitations of wrought iron **07**
- OR**
- Q.3** (a) Give composition properties and uses of malleable cast iron. **07**
(b) Which are advantages and limitations of powder metallurgy? **07**
- Q.4** (a) Draw neat sketch of metallurgical microscope. Explain its construction **07**
(b) What is solid solution? Explain types of solid solution. Also give Hume Rothay's rules. **07**
- OR**
- Q.4** (a) What are the purpose of alloying? Give effects of nickel as an alloying elements. **07**
(b) Give composition and uses of Monel metal and nichrome. **07**
- Q.5** (a) What is non destructive test? List various non destructive test. Explain X-ray radiography. **07**
(b) (1) Draw iron carbon equilibrium diagram. **07**
(2) Define allotropy. Explain allotropy of iron.
- OR**
- Q.5** (a) What is cathodic protection? Explain **07**
(b) Give composition properties and uses of Y-alloys. **07**
