GUJARAT TECHNOLOGICAL UNIVERSITY BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015

Subject Code: 2152106 Date:17/12/ 2015

Time:10:30am to 1:00pm 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) What is plain carbon steel? Discuss about advantages and limitations of plain 07 carbon steel.
 - (b) Define austentic grain size. Explain effect of grain size on properties of steel. 07
- Q.2 (a) Explain briefly the BCC and FCC structure and calculate the atomic packing factor for BCC structure.
 - (b) Draw and explain Iron–Iron Carbide equilibrium diagram. Label all components properly.

OR

- (b) Briefly explain the Eutectic and peritectic reactions using proper examples. Write a note on allotropy.
- Q.3 (a) Write and explain the Hume-Rothery Rules of solid solution formation with 07 suitable examples.
 - (b) What is Metallography? Discuss about polishing techniques for metals and alloys. **07** Give the requirements of etching in microscopic observation.

OF

- Q.3 (a) Explain the nucleation and growth mechanism for the solidification of metals.
 - (b) Draw neat sketch of metallurgical microscope and label it. Explain the function of its components.
- Q.4 (a) Define equilibrium diagram. What information may be obtained from an equilibrium diagram? Explain its role in the development of new alloys.
 - (b) Draw and briefly explain the Aluminium-Silicon binary phase diagram. 07

OR

- Q.4 (a) Draw the Copper-Nickel binary phase diagram and explain it. 07
 - (b) What is cooling curve? Draw the cooling curves for binary solid solution alloy and binary eutectic alloy.
- Q.5 (a) What is cast Iron? Explain how malleable cast iron produce from white cast iron. 07
 - (b) Briefly explain the effect of various alloying elements on the properties of steel. 07

OR

- Q.5 (a) Mention the properties and applications of Grey cast iron and compare it with white cast iron.
 - (b) What do you mean by Coding of steel? Discuss about Coding of steel as per American Standard.
