

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V • EXAMINATION – SUMMER • 2014

Subject Code: 152101**Date: 11-06-2014****Subject Name: Iron Making****Time: 10.30 am - 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) i) Name the various integrated steel plants of India and mention their source of raw materials. **04**
 ii) Comment on typical iron ore deposit in India. **03**
 (b) Give a brief History of Iron making and explain the factors affecting the valuation of iron ore. **07**
- Q.2** (a) Explain the process of pelletization? Discuss theory of bonding in pelletization with special reference to presence of water particle system. **07**
 (b) Discuss the objective and mechanism of sintering of iron ore fines. Explain the use of super – fluxed sinter in modern blast furnace. **07**
- OR**
- (b) Write Short Notes of the following: **3+2+2**
 (1) Bell less charging system (2) RAFT (3) Pulverized coal injection
- Q.3** (a) Discuss the conditions of effective desiliconization and dephosphorization in Blast furnace. **07**
 (b) (i) What is “Boudouard reaction”? What are its other names? **04**
 (ii) Explain Kinetics of iron oxide Reduction. **03**
- OR**
- Q.3** Give suitable reasons and explain briefly to the following, draw diagrams if required.
- (a) (i) Shorter in height the cohesive zone, lower will be the silicon content. **04**
 (ii) A rotating chute is provided inside the furnace top cone. **03**
 (b) The thermal reserve zone (TRZ) in the blast furnace is of great importance, explain through temp profile diagram. **07**
- Q.4** (a) Explain Blast furnace slag. Describe briefly the formation of primary slag, bosh slag and Hearth slag. **07**
 (b) What are the factors that affect blast furnace slag properties and its application? **07**
- OR**
- Q.4** (a) What are the factors that control the level of Sulphur in Blast Furnace? **07**
 (b) What is “external desulphurization” and explain any one method of external desulphurization. **07**
- Q.5** (a) What do you mean by direct reduction? How does percentage reduction of an iron ore differs with the percentage of metallization? **07**
 (b) Explain, in detail, the critical role of DRI in the Indian scenario. Describe, briefly, the process parameters associated coal based DR process for the production of DRI. **07**
- OR**
- Q.5** Distinguish the following
- (a) Direct Reduction and Indirect Reduction **07**
 (b) (i) ESP and Ventury washer (ii) Pillaring and Scaffolding **4+3**
