

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-Vth Examination December 2010****Subject code: 152101****Date: 13 /12 /2010****Subject Name: Iron Making****Time: 03.00 pm - 05.30 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 & 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 & 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

1. Bell less charging system **03**

2. RAFT **02**

3. Pulverized coal injection **02**

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 & 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 & Hearth slag. **07**

(b) What are the factors that affect blast furnace slag properties & 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” & 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 **04**

(ii) Pillaring and Scaffolding **03**
