Seat No.: _____ Enrolment No._____

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. ii) Comment on typical iron ore deposit in India.	**04** **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 pelletizsation? 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: (1) Bell less charging system (2) RAFT (3) Pulverized coal injection	**3+2+2**
Q.3	**(a)**	Discuss the conditions of effective desiliconization and dephosphorizsation 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**

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