

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012**

**Subject code: 172106****Date: 28/12/2012****Subject Name: Advance Ferrous Metallurgy****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What are the alternative routes of iron production? Explain Mini blast furnace. **07**
- (b) Pulverized coal injection technique helps to improve the performance of blast furnace. Explain it. **07**
- Q.2** (a) Give different reactions occurring in blast furnace in different sections and in steel making. **07**
- (b) Explain the mechanisms of kinetics of iron oxide reduction in blast furnace. **07**
- OR**
- (b) Explain the process of reduction smelting. **07**
- Q.3** (a) Draw neat sketch of blast furnace, label it properly. Also, show the temperature in the furnace and refractory lining in different sections. **07**
- (b) Explain continuous casting process with neat sketch. **07**
- OR**
- Q.3** (a) What are the sources of sulfur and phosphorous and what is the effect of it on quality of steel. **07**
- (b) Write note on humidification of blast. **07**
- Q.4** (a) What are the problems of Indian steel plant? **07**
- (b) What are different ferroalloys used? Discuss ferrochrome production. **07**
- OR**
- Q.4** (a) List the factors affecting reduction rate of iron ore and discuss them. **07**
- (b) Explain electro slag refining process. **07**
- Q.5** (a) Discuss the sponge iron production. **07**
- (b) What are the advantages of synthetic slag? Discuss. **07**
- OR**
- Q.5** (a) What is VOD process? Compare it to AOD process **07**
- (b) Explain EAF route of steel productions. **07**

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