

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 172106****Date: 29/04/2017****Subject Name: Advance Ferrous Metallurgy (Department Elective - I)****Time: 02:30 PM to 05:00 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) What are the problems of Indian steel plant? Explain. **07**
(b) Enlist the zones in Blast furnace. With neat sketch of Blast furnace write the reaction in each zone. **07**
- Q.2** (a) Write detailed note on mechanisms of kinetics of iron oxide reduction in blast furnace. **07**
(b) Explain the thermodynamics of the reduction of Iron ore. **07**
- OR**
- (b) What are the alternative routes of Iron production? Explain Mini Blast furnace briefly. **07**
- Q.3** (a) Explain process of reduction smelting. **07**
(b) Pulverized coal injection technique helps to improve the performance of blast furnace. Explain it. **07**
- OR**
- Q.3** (a) Draw neat sketch of EAF and explain EAF route of steel production. **07**
(b) Explain electro slag refining process and role of synthetic slag. **07**
- Q.4** (a) Describe “ESR” processes of steel treatment and its application. **07**
(b) Compare AOD and VOD processes. **07**
- OR**
- Q.4** (a) How the high temperature and oxygen enrichment of blast improves the performance of blast furnace? **07**
(b) Write a short note on sponge iron production. **07**
- Q.5** (a) Explain continuous casting process with neat sketch. **07**
(b) Explain “R-H degassing” technique with a sketch. **07**
- OR**
- Q.5** (a) Explain “Double Slag Practice” of steel making in Electric arc furnace and its advantages. **07**
(b) List ferroalloy materials. Discuss the production of ferrochrome. **07**
