Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER • 2014

Subject Code: 172106 **Date: 29-11-2014**

Subject Name: Advance Ferrous Metallurgy

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) Discuss problems of Indian Iron and Steel plants.	4
	(a) (ii) Discuss reasons for low productivity of Blast furnace in India.	3
	(b) Explain factors affecting kinetics of Iron ore reduction.	7
Q.2	(a) (i) List modern techniques and methods which increase productivity and lower coke rate in the Blast furnace.	3
	(a) (ii) Discuss the use of high blast temperature in Blast furnace.	4
	(b) Describe salient features of Mini blast furnace and its future prospects	7
	OR	
	(b) (i) Name coal based and gas based processes of sponge iron production.	2
	(b) (ii) Explain rotary kiln process for sponge iron productions.	5
Q.3	(a) (i) what are typical characteristics of smelting-reduction processes.	3
	(a) (ii) Explain "Corex" process of iron production.	4
	(b) Describe the steps involved in production of "Heat" in electric arc furnace.	7
	OR	
Q.3	(a) (i) what advantages DC arc furnace offers over AC arc furnace?	2
	(a) (ii) Discuss rapid melting technique in electric arc furnaces.	5
	(b) Explain use of sponge iron as a substitute for scrap in electric arc furnace.	7
Q.4	(a) Discuss benefits of secondary steel making processes.	7
	(b) Describe "ESR" processes of steel treatment and its application.	7
	OR	
Q.4	(a) Compare AOD and VOD processes.	7
	(b) Describe ASEA-SKF process of steel treatment.	7
Q.5	(a) Explain the use of synthetic slag and "Perrin process".	7
	(b) Discuss applications of vacuum degassing methods.	7
	OR	
Q.5	(a) Explain different methods of creating vacuum for steel treatment.	7
	(b) Explain continuous casting of steel and comment on yield of metal obtained.	7

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