

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2152108****Date: 17/06/2019****Subject Name: Steel Making****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.

		MARKS
Q.1	(a) Name various integrated and mini steel plants in India.	03
	(b) Draw flow sheet showing different routes of steel making.	04
	(c) Explain the types of slags and their effect at slag-metal interface.	07
Q.2	(a) Multiple Choice Questions:	03
	1) Blowing of oxygen under vacuum is the technique used to produce,	
	a. High carbon steel	
	b. Low carbon steel	
	c. Medium carbon steel	
	d. Ultralow carbon steel	
	2) The exit gas generated during blowing is rich in,	
	a. O ₂	
	b. SO ₂	
	c. CO	
	d. CO ₂	
	3) During steel casting, the steelmaking ladle is emptied through a valve in the bottom of the ladle; as the ladle gradually empties, the ladle top slag coats and solidifies on the side walls of the ladle, and remains there once the ladle is empty. This is termed as,	
	a. Steel making	
	b. Steel glazing	
	c. Steel brazing	
	d. Galvanizing	
	(b) Explain the reaction equilibria for reaction of carbon	04
	(c) Explain the mechanism and importance of Decarburization reaction?	07
	OR	
	(c) Explain the conditions during which, desulphurisation & dephosphorisation can be done from hot metal during steel making operation. Explain briefly.	07
Q.3	(a) Briefly explain the refractory lining used in BOF.	03
	(b) Compare and contrast top blown processes and bottom blown processes.	04
	(c) Explain the construction of Oxygen Lance. What are the advantages and disadvantages of single and multi nozzle lance?	07
	OR	
Q.3	(a) Enlist the sequential operation of electric arc furnace (EAF).	03
	(b) Explain the effects of ladle stirring and its advantages.	04
	(c) List design improvements in modern EAF practice. Discuss briefly about UHP arc furnaces.	07

- Q.4** (a) Discuss the main requirements of deoxidizer in steel making. **03**
(b) What are the sources of inclusion and briefly explain the types of inclusions present in steel. **04**
(c) Explain with neat schematic diagram ladle injection metallurgy. **07**
- OR**
- Q.4** (a) What are the objectives behind secondary steel making? **03**
(b) Explain R-H degasser with the help of a schematic. **04**
(c) Describe VOD process of steel treatment in detail. **07**
- Q.5** (a) What is the need for cleanliness assessment? **03**
(b) What are the gases which are picked up during steel making? Explain any one in detail. **04**
(c) Briefly explain double slag and foamy slag practice for EAF. **07**
- OR**
- Q.5** (a) Explain briefly about methods to prevent re-oxidation during steel casting. **03**
(b) Explain the types of moulds used in continuous casting. **04**
(c) What is continuous casting? Explain vertical continuous caster in detail. **07**

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