Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2152108 **Date: 12/05/2017**

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		**Short Questions**	**14**
	1	In Bessemer process, what were the oxidizing agents?	1
	2	Steel making is autogeneous process. True/False.	1
	3	In LD process of steel making 'LD' stands for.	1
	4	What is the full form of OBM process of steel making?	1
	5	Define Slag.	1
	6	What is JFN? Give the equation for it.	1
	7	What do you mean by *regenerators* in Open Hearth Process?	1
	8	Give the classification based on transformers supplying power to Electric Arc Furnaces.	1
	9	Water-cooled shell panels and water cooling of electrodes, cables increase the consumption of refractories/electrodes. True/False.	1
	10	What is SEN in Continuous Casting?	1
	11	What is the full form of VAD and VOD?	1
	12	What do you mean by *Killed Steel*?	1
	13	What do you mean by inclusions?	1
	14	What are the detrimental effect of P and S in Steel?	1
Q.2	**(a)**	Illustrate with circuit diagram different routes of steel making.	**03**
	(b)	List the integrated and mini steel plant in India.	**04**
	(c)	With outline give history of steel making from Bessemer steelmaking to present day.	**07**
		OR	
	(c)	With diagram explain the reaction at slag-metal interface.	**07**
Q.3	**(a)**	What is the importance of decarburization in Steel Making?	**03**
	(b)	Explain the Reaction equilibria for Reaction of carbon.	**04**
	(c)	In which condition Desulphurisation & Dephosphorisation can be done from hot metal during steel making operation. Explain briefly.	**07**
		OR	
Q.3	**(a)**	Compare and contrast top blown processes and bottom blown processes.	**03**
	(b)	What are the types of slag? Give some example of each.	**04**
	(c)	With diagram briefly explain BOF oxygen lance design, construction and operation.	**07**
Q.4	**(a)**	Enlist the sequential operation of Electric arc furnace.	**03**
	(b)	Briefly explain double slag practice in steel making.	**04**
	(c)	Illustrate with diagram what are the differences between AC-EAF and DC-EAF.	**07**
		OR	
Q.4	**(a)**	What is tundish metallurgy? Briefly explain.	**03**
	(b)	Compare and contrast Induction furnaces and Electric Arc Furnaces.	**04**
	(c)	Compare and contrast AOD and VOD processes.	**07**

Q.5	**(a)**	Explain with example, types of Inclusion. How it affects the mechanical properties of steel.	**03**
	(b)	With figure briefly explain R-H degasser.	**04**
	(c)	Explain with neat schematic diagram Ladle Injection Metallurgy	**07**

OR

Q.5	**(a)**	What are the environmental issues related to steel making?	**03**
	(b)	List the ingot defects and give their remedies.	**04**
	(c)	Write a short note on continuous casting.	**07**

****