UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, April/May 2018

Course: Iron and Steel Processing (MTEG 344)

Semester: VI

Program: B.Tech MSENT

Time: 03 hrs Max. Marks: 100

Instructions:

S. No.		Marks	CO
Q 1	Briefly discuss the importance of Stockline measurement in Blast Furnace.	4	CO3
Q 2	What is meant by acidic and basic oxides in the context of metallurgical slags? Give one example of each.	4	CO1
Q 3	Discuss the factors that affect reducibility of sinter.	4	CO2
Q 4	Discuss the role of vacuum in RH Degassing.	4	CO5
Q 5	Discuss briefly the method used for measuring Coke Strength after Reduction (CSR)	4	CO2
	SECTION B		
Q 6	a) Draw the schematic of Bessemer, KALDO and Hybrid converters used for steelmaking.		
	b) Describe the purpose of mould oscillation during continuous casting of steel?	10	CO4
Q 7	a) Discuss the conditions suitable for removal of Phosphorus in LD Steelmaking.		
	b) When hot metal contains high Si and P, why does it become necessary to carry out external desiliconisation?	10	CO1
Q 8	What are stainless steels?		
Q 0	Discuss any one of the following processes which are used for stainless steelmaking: AOD / VOD	10	CO5
Q 9	a) With the help of schematic diagrams, describe the difference between a wall working and a central working Blast Furnace.	10	CO3
	b) Explain the role of "Coke Charging" in maintaining any particular furnace profile (wall/central working).		
	SECTION-C		
	Draw a well labelled schematic of LD Steelmaking process.	10	CO4

	Answer <u>any two</u> of the following:	5+5	
	a) What is JFN number and how is it measured?		
	 b) What is the approximate tap-to-tap time for an LD converter? Why do you achieve very fast refining rates in LD converter as compared to an open hearth process? c) Draw a graph to show the kinetics of removal of P, Mn, Si and C during LD converter Basic Steelmaking. d) What are the conditions required for effective pheapherus removal during 		
	d) What are the conditions required for effective phosphorus removal during steelmaking?		
Q 11	a) Draw well labelled schematic diagrams for any two of the below mentioned processes: i) COREX process , ii) Blast Furnace, iii) RH Degassing, iv) Continuous Casting	5+5	
	b) What is Directly Reduced Iron? c) Sintering and Pelletizing are not competing but complimentary processes. Justify this statement.	5 5	CO5