

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2152104****Date: 31/05/2019****Subject Name: Fuels, Furnaces, Refractories and Pyrometry****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) Discuss the use of Wind energy as a fuel.	03
	(b) Describe the importance of proximate and ultimate analysis of fuel.	04
	(c) Define fuel and prepare a comparative statement between advantages and disadvantages of solid, liquid and gaseous fuels.	07
Q.2	(a) List various factors which affect heating capacity of furnaces.	03
	(b) Discuss the manufacturing process of producer gas.	04
	(c) Explain that how one can determine the calorific value of a given coal sample by using bomb calorimeter.	07
	OR	
	(c) Differentiate between low temperature carbonization (LTC) & high temperature carbonization (HTC) process.	07
Q.3	(a) Discuss effect of excess air on products of combustion.	03
	(b) Discuss the Hardgrove grindability test.	04
	(c) List various factors should be taken into account during furnace design. Discuss about chimney height.	07
	OR	
Q.3	(a) Discuss the factors governing complete combustion of a fuel.	03
	(b) Discuss the method to recover the by-products in carbonization process.	04
	(c) Explain the role of draft in furnace design. Differentiate between Natural, forced, induced and balanced draft.	07
Q.4	(a) Define refractory and classify it. Give examples of each.	03
	(b) List the advantages of monolithic refractories.	04
	(c) Explain the construction and working of induction furnace.	07
	OR	
Q.4	(a) What is the difference between coreless and channel induction furnace?	03
	(b) What is clinker formation? How one can minimize it.	04
	(c) Mention the types of arc furnace and explain the construction and working of arc furnace. Enlist the advantages of direct arc furnaces?	07
Q.5	(a) What is thermoelectric inversion? Explain.	03
	(b) Discuss the working principle of Thermocouple.	04
	(c) What is the importance of pyrometric cone equivalent? Explain the test with figure.	07
	OR	
Q.5	(a) What are the parameters affect accuracy of Radiation Pyrometers?	03
	(b) Discuss the general requirements of a refractory material.	04
	(c) Explain with diagram the working principle of temperature measurement by optical pyrometer.	07
