GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V • EXAMINATION – WINTER 2013

Subject Code: 152104   **Date: 02-12-2013**
Subject Name: Fuels, Furnaces & Refractory
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)**	Define 'Fuel'? Give detail classification of fuels based on chemical nature, occurrence and usage & give their merits & demerits	**07**
	(b)	Explain the combustion Properties of fuel.	**07**
Q.2	**(a)**	Write a brief note on Proximate and Ultimate analysis of fuel?	**07**
	(b)	Define carbonization and differentiate between Low Temperature carbonization (LTC) & High Temperature carbonization (HTC) .	**07**
		OR	
	(b)	Write short note on Producer Gas.	**07**
Q.3	**(a)**	Discuss the factors which affect heating capacity and fuel economy of furnaces.	**07**
	(b)	Explain about various form of energy and write their applications in different fields.	**07**
		OR	
Q.3	**(a)**	Define refractory and describe properties of refractories. Discuss the factors considered before selecting a refractory for a metallurgical application ?	**07**
	(b)	Define refractoriness under load (RUL) and explain RUL test.	**07**
Q.4	**(a)**	Draw flow chart of main steps to be followed in Manufacturing of refractory. Described about each step in brief	**07**
	(b)	Explain principle of working of Thermocouple and give examples of thermocouples	**07**
		OR	
Q.4	**(a)**	What is Pyrometry ? Explain optical pyrometer with its principle, construction, working and advantages.	**07**
Q.4	**(b)**	Describe various modes of Heat Losses from a furnace.	**07**
Q.5	**(a)**	Explain Construction and Principle of working of an Induction Furnace with sketch	**07**
	(b)	Explain, How waste Heat can be recovered from flue gases?	**07**
		OR	
Q.5	(a)	Write short note about Resistance heating furnace	07
	(b)	Discuss High Alumina Refractories.	07

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