

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V- EXAMINATION – SUMMER 2016****Subject Code: 152104****Date: 06/05/2016****Subject Name: Fuels, Furnaces and Refractory****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.

- Q.1** (a) What do you mean by term Fuel? Classify fuel and discuss importance of coke as fuel in metallurgical industry. **07**  
(b) Define carbonization and differentiate between LTC and HTC. **07**
- Q.2** (a) Define calorific value and give details of Bomb Calorimeter to measure the calorific value of given fuel. **07**  
(b) Describe the working and construction of cupola. **07**
- OR**
- (b) What are different non conventional fuels? Discuss their applications. **07**
- Q.3** (a) Discuss pyrometric cone equivalent test for refractory materials in detail. **07**  
(b) What is spalling resistance? Discuss method to measure it. **07**
- OR**
- Q.3** (a) Define and classify furnace and refractories. **07**  
(b) What is pyrometry? State principle of thermocouple and discuss its construction and calibration. **07**
- Q.4** (a) Explain optical pyrometer with its principle, working and advantages. **07**  
(b) Discuss various requirements of good refractory material. **07**
- OR**
- Q.4** (a) What is Flash and Fire point? How they are tested. **07**  
(b) Write note on Producer gas. **07**
- Q.5** (a) Write note on Coke oven gas. **07**  
(b) What is the principle of induction furnace? Explain working of induction furnace. **07**
- OR**
- Q.5** (a) Discuss the role of furnace atmosphere. **07**  
(b) What are different heat losses in furnace and how they are minimized? **07**

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