

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-Vth Examination December 2010****Subject code:152104****Subject Name: Fuels, Furnaces & Refractory****Date: 18 /12 /2010****Time: 03.00 pm - 05.30 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' ? What is 'fossil Fuel'? Give general classification of fuels **07**
 (b) Give advantages & disadvantages of Solid, Liquid & Gaseous fuels ? **07**
- Q.2** (a) Define carbonization and differentiate between Low Temperature carbonization (LTC) & High Temperature carbonization (HTC) . **07**
 (b) Write short notes (**Any One**) : **07**
 i) Producer Gas ii) Water Gas iii) Coke Oven Gas
OR
- (b) Write short Notes (**Any Two**) **07**
 i) Nuclear Fuels ii) Geothermal Energy iii) Biomass
- Q.3** (a) Define refractory and describe properties of refractories. What are the points considered before selecting a refractory for a metallurgical application ? **07**
 (b) Define refractoriness under load (RUL) and explain RUL test. **07**
OR
- Q.3** (a) Describe different refractory materials based on chemical nature with examples. **07**
 (b) Draw flow sheet for wet or dry process of fireclay brick manufacture and mention different stages of firing **07**
- Q.4** (a) Compare Batch Furnaces and Continuous Furnaces used For heat treatment of metals and alloys. **07**
 (b) Describe working of any continuous furnace used for Heat treatment with a sketch.. **07**
OR
- Q.4** (a) Explain construction and working of an Electric Arc Furnace used for steel melting. **07**
 (b) List advantages of Laser used in Heat treatment. **07**
- Q.5** (a) What is a flame? Explain different flame temperatures. **07**
 (b) What is the difference between Natural draught, Induced Draught and Balanced draught. **07**
OR
- Q.5** (a) Describe various modes of Heat Losses from a furnace. **07**
 (b) How waste heat can be recovered from Furnace flue gases? **07**
