

**II B.Tech II Semester Supplementary Examinations, January 2005**  
**FUELS TECHNOLOGY AND REFRACTORIES**  
**(Metallurgy & Material Technology)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Explain significance of constituents of coal.  
(b) Describe determination of calorific value of coal.
2. (a) Explain properties of metallurgical coke.  
(b) Describe industrial coke making practice in coke ovens attached to steel plants.
3. (a) Give classification of petroleum.  
(b) Explain principles involved in production of fuel oil from crude.
4. (a) Describe production, properties and uses of water gas.  
(b) Explain properties and uses of Blast furnace gas.
5. (a) Compare solid, liquid and gaseous fuels.  
(b) A producer gas with the composition by volume, 27.3%CO, 5.4%CO<sub>2</sub>, 0.6%O<sub>2</sub> and 66.7%N<sub>2</sub> is burnt with 20% excess air. If the combustion is 98% complete, calculate the composition by volume of the flue gases.
6. Describe manufacture and explain properties and applications of either fire clay OR chromite refractories.
7. (a) Explain modes of failure of refractories in service and its prevention.  
(b) Describe application of refractories in electric arc furnaces.
8. Explain testing of any THREE of the following properties of the refractories.
  - (a) Refractoriness under load
  - (b) Permeability
  - (c) Abrasion resistance
  - (d) Slag and vapour resistance.

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