

2E1026

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2E1026**B. Tech. II Semester (Main/Back) Examination, June/July-2011****Common for All Branches
206 Engineering Chemistry-II****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit - I

1. a) What is synthetic petrol? Explain the manufacturing of petrol by Fischer-Tropsch process (8)
- b) What is carbonization of coal? Describe with a diagram, the Beehive oven method for the manufacturing of metallurgical coke. (8)

OR

- a) What is producer gas? How it is manufactured? Give the chemical reactions taking place in its various different zones. (8)
- b) Write the short notes on any two of the following:- (4+4)
 - i) Coal gas
 - ii) Classification of fuel
 - iii) Refining of Crude petroleum
 - iv) Anti-knocking agents

Unit - II

2. a) Explain the method of ultimate analysis coal. What is the significance of ultimate analysis. (8)
- b) Calculate the gross calorific and net calorific value of a coal sample having the following composition:
C = 80%; H = 7%; O = 3%; S = 3.5%; N = 2.1% and ash = 4.4% (8)

OR

- a) What is Calorific Value of solid fuel? Explain the working of Bomb Calorimeter, with diagram, for the determination of Calorific Value of solid fuel. (10)

- b) The percentage composition of a sample of bituminous coal was found to be as under:
 C = 75.4%; H = 4.5%; O = 12.5%; N = 3.1%; S = 1.4%; ash = 3.1%
 Calculate the minimum amount of O₂ and air by weight required for the complete combustion of 1Kg, of coal. (6)

Unit - III

3. What is Phase Rule? Explain the various terms involved in phase rule by taking suitable example. Discuss water system. (16)

OR

- a) Describe with phase diagram the two component Ag-Pb system. (8)
 b) Write short notes on any **two** of the following: (4+4)
 i) Triple point
 ii) Eutectic point
 iii) Reduced phase rule

Unit - IV

4. a) What is organic electronic material? Explain the conductivity in polymer polyaniline. (8)
 b) What are fullerenes? Explain their preparation, properties and uses. (8)

OR

- a) Explain superconductors. Describe the super conductivity in cuprates. (6)
 b) Write short note on any **two** of the following : (5+5)
 i) Total internal reflection in optical fibers
 ii) Application of super conductors
 iii) Doping in polymers.

Unit - V

5. What is corrosion? Explain the mechanism and remedies of wet electrochemical corrosion. (16)

OR

- Explain **two** of the following : (8+8)
 i) Pitting Corrosion
 ii) Caustic embrittlement
 iii) Pilling Bedsworth Rule.