

2E1026

Roll No. _____

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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 O_2 and air by weight required for the complete combustion of 1 Kg. 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.

OR

- a) Explain the method of ultimate analysis coal. (8)
b) Calculate the gross calorific and net calorific value of the following composition: (10)
C = 80%; H = 7%; O = 3%; S = 3.2%; N = 3.1% and ash = 4.4%