2E1026

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B. Tech. II Sem. (Old Back) Exam., May - 2017

Common for All Branch

206 Engineering Chemistry - II

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 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 suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT – I

Q.1 (a) How metallurgical coke is manufactured by Otto-Hoffmann's by product coke oven process? [10]

(b) What are the advantages of gaseous fuel over solid and liquid fuel? Give one example of gaseous fuel with its calorific value. [6]

OR

Q.1 (a) Describe Fischer Tropsch's process for the manufacture of synthetic petrol. [10]

(b) What is knocking and Octane number? Give names of two antiknocking substances. [6]

UNIT – II

Q.2 (a) Derive complete formula for determining calorific value of a solid fuel by bomb calorimeter. [10]

(b) Calculate the mass of air required for complete combustion of 5 kg of coal containing 80% carbon, 15% hydrogen and rest is oxygen, if 40% excess air is supplied. [6]

OR

Q.2 (a) Write short notes on any two of the following: [5+5]

(i) Significance of proximate analysis

(ii) Delong's formula for calorific value of a fuel.

(iii) Combustion: Write balanced equation for the combustion of methane, acetylene and Hydrogen gases.

(iv) Importance of ultimate analysis.

(b) The ultimate analysis of a coal sample gives :

C = 84%

O = 8.4%

H = 5.5 %

S = 1.5%

N = 0.6%

Calculate the higher (Gross) and lower (Net) calorific values of the sample. [6]

UNIT – III

Q.3 State and explain phase rule of one component system with diagram, taking water system as an example [16]

OR

Q.3 Describe the application of phase rule to Ag – Pb system with the help of diagram. What is Eutectic point? [16]

UNIT – IV

Q.4 (a) What are type – I and type – II super – conductors? Write important applications of superconductors. [10]

(b) Discuss the structure of C_{60} fullerenes. [6]

OR

Q.4 (a) What are organic electronic material? How conjugated Π – electrons are used for conductivity in poly-aniline, poly-pyrrole, and poly-acetylene. [10]

(b) Discuss the principle and working of optical fibres. [6]

UNIT – V

Q.5 (a) What is corrosion? Describe in detail the electrochemical (wet) corrosion of metals. [10]

(b) Explain cathodic protection to prevent corrosion. [6]

OR

Q.5 (a) What is corrosion? Describe in detail the chemical (dry) corrosion of metals. [10]

(b) Explain anodic sacrificial protection to minimize corrosion. [6]
