

1E2004

Roll No. _____

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1E2004**B.Tech. I Semester (Main/Back) Examination, Dec. - 2016****104 Engineering Chemistry****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks (Old back) : 24****Min. Passing Marks (M/B): 26****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.

Unit - I

1. a) What is carbonization of coal? Describe OHo-Hoffmann's By - product oven method of coke manufacturing. (8)
- b) What is oil gas? Explain the manufacturing of oil gas and its uses. (8)

OR

1. a) What is cracking of fuel? Describe with diagram moving - bed catalytic cracking of petroleum. (8)
- b) Write short notes on any two of the following:
 - i) Characteristics of good fuel.
 - ii) Refining of petroleum
 - iii) Pulverized coal and its advantages (4+4)

Unit - II

2. a) Describe the determination of calorific value of gaseous fuel by Junker's Calorimeter. (10)
- b) The following data were obtained in a Junker's experiment
 - i) Volume of gas used = 0.1 m^3 at STP
 - ii) Weight of water heated = 26 kg

- iii) Temperature of inlet water = 26°C
- iv) Temperature of outlet water = 36°C
- v) Weight of steam condensed = 0.030 kg.

Calculate the higher and lower calorific value at STP. Take latent heat of vaporization of water as 580 K cal/kg. (6)

OR

2. a) Write short notes on any two of the following:
- i) Orsat's analysis of fuel gases.
 - ii) Ultimate analysis of coal
 - iii) Requirement of air in combustion of coal. (5+5)
- b) Determine the theoretical weight of air required for the complete combustion of fuel having C = 75%, H = 8% and O = 3% percentage composition. Assuming that 50% excess air is to be used calculate the weight of air supplied. (6)

Unit - III

3. a) Explain the mechanism of conductivity induced in poly aniline. (8)
- b) Distinguish between addition and condensation polymerization. (8)

OR

3. Write notes on any four of the following:
- i) Manufacture and uses of nylon.
 - ii) Classification of polymer.
 - iii) Manufacture and uses of Nitrile Rubbers
 - iv) Copolymerization
 - v) Fullerenes and its applications. (4×4)

Unit - IV

4. a) Describe the property of setting and hardening of cement. (8)
- b) What is glass? Describe the steps involved in manufacture of glass. (8)

OR

4. a) What is optical fibre? Discuss the structure and working of optical fibres. (6)

b) Explain the significance of basic constituents of cement. (6)

c) Write a note on aluminosilicate glasses and its uses. (4)

Unit - V

5. a) Discuss the use of Seger's cone test and RUL tests for a good refractory (10)

b) Describe fire clay refractory its properties and uses. (6)

OR

5. Explain the following:

a) Steam emulsification number.

b) Functions of lubricants.

c) Viscosity Index.

d) Thin layer lubrication

(4×4=16)

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