6/7/2015

2012

Roll. No.: _____ Total No. of Pages: 4

2E1004 P

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B.Tech. I Year II Sem. (Old Back) 2007-08 & 2008-09
June-July Examination, 2015
Common to all branches of Engg.
203 Chemistry

Time: 3 hours *Maximum Marks: 80*
Min. Passing Marks: 24

Note: 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.

1. NIL 2. NIL

UNIT-I

Q. 1 (a) What do you mean by $CaCO_3$ equivalent? Discuss Clark's method for determining the hardness of water. 4+8

(b) Write short note on 'Break Point Chlorination'. 4

OR

Q. 1 (a) Explain Zeolite method of water softening in detail. 10

(b) Calculate the quantities of lime and soda needed for softening 30,000 litres of hard water which analyzed as follows:

(i) Ca^{2+} = 18 ppm.

(ii) Mg^{2+} = 6 ppm.

(iii) HCO_3^- = 8 ppm.

(iv) Dissolved CO_2 = 4 ppm.

(v) HCl = 10 ppm.

(vi) CO_3^{2-} = 3 ppm.

(vii) OH^- = 18 ppm.

Purity of lime is 95% and soda is 98%. 6

UNIT-II

Q. 2 (a) What is synthetic petrol? Describe Fischer - Tropsch process. How this process differs from Bergius process? 2+6+2

(b) Write short notes on the following:

(i) Octane number

(ii) Knocking 6

OR

Q. 2 (a) The percentage composition by weight of a sample of coal was found to be as under:

(i) C = 81%

(ii) H = 5%

(iii) O = 8.5%

(iv) S = 1

(v) N = 1%

(vi) ash = 3.5%

Calculate the minimum amount of O_2 and air required for complete combustion of 1 Kg. of this coal. 6

(b) Write a brief account of the proximate and ultimate analysis of coal with their significance. 5+5

UNIT-III

Q. 3 (a) Write short notes on the following:

(i) Metastable equilibrium

(ii) Eutectic point 4×2 = 8

(b) What is phase rule and phase diagram? Discuss phase diagram of sulphur system. 8

OR

Q. 3 (a) Explain classification of polymers with examples. 6

(b) Define:

(i) Flash and fire point. 5

(ii) Viscosity and viscosity index 5

UNIT-IV

Q. 4 Write short notes on the following:

(i) Superconductors

(ii) Fullerenes

(iii) Pitting corrosion

(iv) Stress corrosion 4×4 = 16

OR

Q. 4 (a) Explain the electrochemical theory of corrosion with mechanism. 10

(b) Write short note on properties of optical fibres and their uses. 6

UNIT-V

Q. 5 (a) What are refractories? How are they classified? Give the essential requirement of good refractories. 2+3+5

(b) Discuss the following:

(i) Boro silicate glass

(ii) Optical glasses 3×2 = 6

OR

Q. 5 (a) Write short note on vertical shaft kiln technology. 4

(b) Discuss the mechanism of setting and hardening of the cement. 6

(c) Discuss preparation of ordinary glass. 6

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