1E2205

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B. Tech. I Sem. (Main) Exam., Dec. - 2017

CY-101 Engineering Chemistry

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 28

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Instructions to Candidates:

*Attempt any **five questions,** including Question **No.1 which is Compulsory.** 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

Q.1 Compulsory. Answer for each sub-question be given in about 25 words- [8×2=16]

(a) Essential parameter of potable water.

(b) What are Net Calorific Value (NCV) and a Gross Calorific Value (GCV) of fuel?

(c) Calgon conditioning of boiler.

(d) Properties of conducting polymers.

(e) Industrial significance of viscosity measurement.

(f) Water line corrosion.

(g) Role of gypsum in cement.

(h) Importance of annealing of glass.

Q.2 (a) Describe zeolite method of water softening with its limitations. [10]

(b) Discuss preventive measures to minimize the problem of scale formation in boilers. [6]

Q.3 (a) What is carbonization of coal? Explain Beehive coke oven method of coal carbonization. [12]

(b) Explain the composition and uses of coal gas. [4]

Q.4 (a) What do you mean by synthetic rubbers? Explain the manufacture properties and uses of Buna –S and Buna – N rubbers. [8]

(b) Thick layer lubricating mechanism and application in machines. [8]

Q.5 (a) Explain theory of wet electrochemical corrosion of metals. [8]

(b) Discuss various methods for the prevention of corrosion. [8]

Q.6 (a) What is cement? Explain manufacturing of cement by Rotatory kiln technology with diagram and reactions involved in the process. [10]

(b) Calculate the requirement of Lime & Soda for softening 10^5 litres of water. Analysis of water is as follows:- [6]

HCO_3^- = 396.5 mg/Lit ; Mg^{+2} = 42 mg/Lit

Ca^{++} = 90 mg/Lit ; H^+ = 1.5 mg/Lit

$FeSO_4.7H_2O$ = 14 mg/Lit

The purity of Lime is 91% and that of Soda is 97.2%

Q.7 (a) What do you mean by refractory material? Explain important properties of refractories. [8]

(b) Describe manufacturing, properties and uses of Silica glass. [4]

(c) Calculate the gross and net calorific values of a coal sample having the following composition: [4]

C = 80% ; H = 07% ; O = 03% ; S = 3.5% ; N = 2.1% and ash = 4.4%
