1E3103

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B. Tech. I - Sem. (Main / Back) Exam., - 2023

1FY2 – 03 Engineering Chemistry

Time: 3 Hours **Maximum Marks: 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

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.

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

1. NIL 2. NIL

PART – A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1 What is carbonate hardness?

Q.2 What is phosphate conditioning?

Q.3 Properties and uses liquid fuel.

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Q.4 Define cetane number.

Q.5 Cathodic protection of metal.

Q.6 Give proportion basic constitution of cement.

Q.7 Importance of lubrication in machines.

Q.8 Properties and uses of hard glass.

Q.9 Discuss elimination reaction with example.

Q.10 Why fire point is higher than flash point?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1 Analysis report of water is as per the following –

$Mg(HCO_3)_2$ = 73mg/litre ; $MgSO_4$ = 60mg/Litre

$CaCl_2$ = 111mg/litre ; $CaCO_3$ = 50mg/Litre

HCO_3 = 122mg/litre ; H_2CO_3 = 100mg/Litre

Calculate the requirement Lime and Soda for softening 1,00,000 Litres of water.

Q.2 Calculate the gross and net calorific values of coal sample with following composition - https://www.rtuonline.com

C = 85%; H = 5%; O = 2%; S = 1%; N = 2%; Ash = 5%

Q.3 Explain galvanic corrosion with proper example.

Q.4 Discuss the importance of Lime saturation factor and Silica Modulus in cement manufacturing.

Q.5 Discuss the cloud point and pour point of lubricating oil with its importance.

Q.6 Explain break point chlorination method of sterilization.

Q.7 Describe the mechanism of free radical halogenation of alkenes.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

Q.1 What is water softening? Describe water softening by zeolite method with labelled diagram. [10]

Q.2 Define coke. Explain Otto-Hoffmann by Product Oven Method for making coke. [10]

Q.3 (a) Explain the mechanism of electrochemical net corrosion with example. [7]

(b) What is pilling - bedwroth rule. [3]

Q.4 (a) Explain the property of setting and hardening of cement. [7]

(b) Role of gypsum addition in cement. [3]

Q.5 (a) Explain the manufacturing, properties and uses of Paracetamol. [7]

(b) Importance of drugs in daily life. [3]