

**1E3103**

**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. NIL2. 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.
- Q.4 Define octane 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**

**[5x4=20]**

### **(Analytical/Problem solving questions)**

#### **Attempt any five questions**

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

$Mg(HCO_3)_2 = 73\text{mg/litre}$  ;  $MgSO_4 = 60\text{mg/Litre}$

$CaCl_2 = 111\text{mg/litre}$  ;  $CaCO_3 = 50\text{mg/Litre}$

$HCO_3 = 122\text{mg/litre}$  ;  $H_2CO_3 = 100\text{mg/Litre}$

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]

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