

1E2403

Roll No.

Total No of Pages: 3

1E2403

B. Tech. II - Sem. (Main) Exam., May - 2019

BSC

2FY2 - 03 Engineering Chemistry
(Common for all branches)

Time: 3 Hours

Maximum Marks: 160

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four 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. Calculator (Non Programmable)2. NIL**PART - A****(Answer should be given up to 25 words only)****[10×3=30]****All questions are compulsory**

- Q.1 What are the advantages of break point chlorination? [3]
- Q.2 State harmful effects of Scale and Sludge formation in boilers. [3]
- Q.3 What are the characteristics of good metallurgical Coke? [3]
- Q.4 Name the catalysts used for the synthesis of gasoline by Fischer-Tropsch Method. [3]
- Q.5 Define Octane No. of Gasoline. [3]
- Q.6 How galvanizing protects iron from corrosion? [3]
- Q.7 Why is gypsum added to cement? [3]
- Q.8 What is Annealing of glass? Give its importance. [3]
- Q.9 Name the additives mixed with lubricant used for Extreme pressure lubrication. [3]
- Q.10 What is Nucleophile? [3]

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PART - B

(Analytical/Problem solving questions)

[5×10=50]

Attempt any five questions

- Q.1 A water sample contains following impurities: $\text{Ca}(\text{HCO}_3)_2 = 16.2$ ppm, $\text{Mg}(\text{HCO}_3)_2 = 14.6$ ppm, $\text{CaCl}_2 = 11.1$ ppm, $\text{MgSO}_4 = 12.0$ ppm, and $\text{HCl} = 7.3$ ppm. Calculate quantity of lime (90% pure) and soda (85% pure) required for softening of 100,000 litres of hard water using 8.2 ppm of NaAlO_2 as a coagulant. [10]
- Q.2 What are Zeolites? Explain softening of hard water by Zeolite method with neat and well labeled diagram and reactions. How zeolite bed is regenerated? [10]
- Q.3 Ultimate analysis of a fuel gave following results. $\text{C} = 80\%$, $\text{H} = 5\%$, $\text{O} = 3\%$, $\text{S} = 5\%$, $\text{N} = 5\%$, $\text{Ash} = 2\%$. Calculate amount of air required for complete combustion of 1 kg of fuel if 50% excess air is supplied. [10]
- Q.4 What is Oil Gas? Give its synthesis, composition, calorific value and uses. [10]
- Q.5 What is Flash and Fire point of a lubricating oil? How is it determined by Pensky Martins apparatus? Also give its significance. [10]
- Q.6 What is glass? How is glass manufactured by Tank furnace? Explain with neat and well labeled diagram. [10]
- Q.7 Write preparation, properties and uses of Paracetamol Drug. [10]

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×20=80]

Attempt any four questions

- Q.1 What is hardness of water? Explain determination of hardness of water by complexometric method using EDTA. [20]
- Q.2 Define calorific value of fuels. How calorific value of solid fuels is determined by Bomb calorimeter? Describe with neat and well labeled diagram. [20]
- Q.3 What is Corrosion? Explain theory of Electrochemical Corrosion. What are the factors affecting corrosion of metals? [20]
- Q.4 What are the various raw materials used for manufacturing of cement? Explain manufacturing of Portland cement with neat and well labeled diagram of Rotary Kiln. Also give chemical reactions taking place during the process. [20]
- Q.5 What are the different types of organic reactions? Explain reaction mechanism of addition reactions with suitable examples. [20]
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