

21503

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B. Tech. II Sem. (Main) / B. Tech. I Sem. (Back)

Exam., May - 2019

BSC

2FY2-03 / 1FY2-03 Engineering Chemistry

Time: 3 Hours

Maximum Marks: 160

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 10×3 marks = 30 marks. All ten questions are compulsory.

Part – B: Analytical/Problem solving questions 5×10 marks = 50 marks. Candidates have to answer five questions out of seven.

Part – C: Descriptive/Analytical/Problem Solving questions 4×20 marks = 80 marks. Candidates have to answer four questions out of five.

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

Q.1 Draw the structure of Paracetamol. [3]

Q.2 Give the chemical reaction of propene and HBr. [3]

Q.3 Why broken pieces of glass are mixed in the raw materials of Tank Furnace? [3]

Q.4 Define the Term Viscosity Index. [3]

- Q.5 What is Octane Number? [3]
- Q.6 Calculate the hardness of water sample containing 33.3mg of CaCl_2 in 300ml volume. [3]
- Q.7 Give any two differences between sludge and scale. [3]
- Q.8 Galvanization of Food Packaging Articles is not done. Why? [3]
- Q.9 Justify the role of adding $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ in the cement. [3]
- Q.10 Give the Dulong's formula to calculate the calorific value of a fuel. [3]

PART – B

- Q.1 Explain the manufacturing of Coke by Beehive coke oven method. [10]
- Q.2 Explain the Deionization process of water by Ion-Exchange process. [10]
- Q.3 Write short notes on- [5+5=10]
- (a) Cloud and Pour-Point
- (b) Borosilicate Glass
- Q.4 Describe knocking in Internal Combustion Engine. [10]
- Q.5 Write a note on Setting and Hardening of cement. [10]
- Q.6 Compare Galvanizing and Tinning methods to prevent corrosion. [10]
- Q.7 Explain the SN^2 Mechanism for Nucleophilic Substitution Reactions in Halo-Alkanes. [10]

PART - C

Q.1 (a) Explain the determination of calorific value of a gaseous fuel with the help of Junker's Calorimeter with suitable diagram. [12+8=20]

(b) 2.5g of a sample of coal was analyzed for content of Moisture, Volatile Matter and Ash. From the following data, calculate above quantities. Mass of coal after heating at 110°C = 2.365g.

Mass of coal after heating covered crucible at 950°C = 1.165g.

Constant Mass obtained at the end of experiment = 0.460g.

Q.2 Explain the manufacturing of cement by Rotary Kiln Technology with suitable diagram and chemical reactions. <http://www.mgsuonline.com> [8+6+6=20]

Q.3 Describe the softening of hard water by lime soda process in following sub-parts- [20]

(a) Chemical Reactions with lime and/or soda.

(b) Labelled diagram of hot lime soda process.

(c) Formula to calculate lime requirement and soda requirement.

Q.4 (a) Discuss the Rearrangement Reactions in organic compounds with suitable examples. [10+10=20]

(b) Discuss the formation, structure and geometry of carbocation's with any two reactions in which these are formed.

Q.5 Write Notes on the following-

[5×4=20]

- (a) Cathodic Protection Method
- (b) Pitting Corrosion.
- (c) Extreme Pressure Lubrication
- (d) Red Wood Viscometer

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