

U23



Matrusri Engineering College

(An Autonomous Institution)

(Approved by AICTE & Affiliated to Osmania University)

B.E. I Semester (Main) (Branch: CIVIL,EEE,ECE,MECH,IT) Examination, Feb 2024

Subject: ENGINEERING CHEMISTRY

Time : 3 hours

Max. Marks : 70

- Note :
- FIRST** Question is compulsory and answer any **FOUR** questions from the remaining six questions. Each question carries 14 Marks.
 - Answers to each question must be written at one place only and in the same order as they occur in the question paper.
 - Missing data, if any, may suitably be assumed.

- 500ml of water sample contains 7.3mg of $Mg(HCO_3)_2$, 5.85mg of NaCl, and 5.55mg of $CaCl_2$. Compute its total hardness in ppm. (2)
 - Corrosion always takes place at anode but corrosion product deposits nearer to cathode-Reason (2)
 - List any three differences between addition and condensation polymerization and mention one example for each. (2)
 - What is the significance of presence of Sulphur in ultimate analysis of coal? (2)
 - Write any four advantages of composite materials. (2)
 - Write name of the monomers for the following polymers (2)
 - $-(CH_2-CH(Cl))_n-$
 - $-(CH_2-CH=CH-CH_2-CH_2-CH(C_6H_5))_n-$
 - Differentiate blue hydrogen and green hydrogen and which is better for environment. (2)
- 50ml of standard hard water requires 10ml of EDTA for color change with EBT indicator. 25ml of sample water requires 8ml of same EDTA for color change with EBT indicator. 10ml of same sample water after boiling and filtering requires 3ml of same EDTA for color change with EBT indicator. Calculate its temporary, permanent and total hardness in ppm. Standard hard water was prepared by using 0.5g of $CaCO_3$ and dissolved in 1000ml of water. (7)
 - Define brackish water and how to soften using electrodialysis method using neat, labeled diagram. (7)
 - Write the principle and discuss water line corrosion and pitting corrosion. In these, which one causes more damage to metal when the environment is same for both types of corrosion? (7)
 - Illustrate the galvanizing process with a neat, labeled diagram and mention the condition required in terms of melting point for a coating metal with respect to a base metal. (7)
 - What are conducting polymers? Explain the p-type mechanism of conduction of poly acetylene. (7)
 - Write the preparation, properties, and uses of
 - Bakelite
 - PET
 - Define cracking and write its significance. Discuss moving bed catalytic cracking process with a neat, labeled diagram. (7)
 - Discuss the construction and working of Lithium-ion battery with neat diagram. (7)

