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B.Tech. (Sem. - 2nd)
ENGINEERING CHEMISTRY
SUBJECT CODE : CH - 101

Paper ID : [A0112]

[Note: Please fill subject code and paper ID on OMR]

Time.: 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Five** questions from Section - B & C.
- 3) Select atleast **Two** questions from Section - B & C.

Section - A

(Marks : 2 Each)

- Q1)** a) What is wet corrosion?
- b) It is not possible to measure the reduction potential of an isolated half cell. Why?
- c) The ^1H NMR spectrum of $\text{C}_4\text{H}_9\text{Br}$ consists of a single line. What could be its structure?
- d) Match each absorption band with the following groups :
- | | | | | |
|-----------------------------|---------------|--|---------------|----------------------------|
| Functional group | >C=O | $\text{-}\overset{ }{\text{N}}\text{-H}$ | -O-H | $\text{-C}\equiv\text{C-}$ |
| $\bar{\nu} \text{ cm}^{-1}$ | 3400 | 2050 | 1700 | 3350 |
- e) What is photochemistry?
- f) Arrange the following in increasing order of UV absorption maxima.
-
- g) Define eutectic.
- h) What are the advantages of chromatography?
- i) Define Phase.
- j) Distinguish between hard water and soft water.

Section - B

(Marks : 8 Each)

- Q2) (a) Describe Zeolite method for softening of water.
(b) A water sample on analysis gave the following:
 $\text{Ca}^{2+} = 30 \text{ mg/L}$, $\text{Mg}^{2+} = 24 \text{ mg/L}$, $\text{CO}_2 = 24 \text{ mg/L}$, $\text{HCl} = 50 \text{ mg/L}$,
 $\text{K}^+ = 10 \text{ mg/L}$. Calculate the quantities of lime (purity 90%) and soda
(purity 94%) required to soften one million litres of water.
- Q3) (a) Describe the concentration cell corrosion.
(b) Discuss the use of corrosion inhibitors.
- Q4) (a) Explain the concept of overvoltage.
(b) What is liquid junction potential?
- Q5) What is chromatography? Discuss the types of chromatography.

Section - C

(Marks : 8 Each)

- Q6) (a) Compare fluorescence with phosphorescence.
(b) A substance is known to have a molar absorptivity of 14,000 at its
wavelength of maximum absorption. With 1 cm cell, calculate the
concentration of this substance for absorbance reading of 0.85 in
spectrophotometer.
- Q7) (a) Discuss the principle and working of spectrophotometer with the help of
a diagram.
(b) Give the range for IR, UV and Visible regions of electromagnetic
spectrum.
- Q8) (a) What do you understand by chemical shift?
(b) Explain nuclear overhauser effect.
- Q9) Discuss phase diagram of potassium iodide – water system.

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