

Roll No.

Total No. of Questions : 09]

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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 | $\text{C}=\text{O}$ | $\text{N}-\text{H}$ | $-\text{O}-\text{H}$ | $-\text{C}\equiv\text{C}-$ |
| v 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.

