

Roll No. ....

Total No. of Questions : 09]

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## Paper ID [CH101]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 1<sup>st</sup>/2<sup>nd</sup>)

CHEMISTRY (CHM - 101)

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 at least **Two** questions from Section B & C.

### Section - A

Q1)

(10 × 2 = 20)

- a) Softening of water is essential, Explain.
- b) Differentiate between temporary and permanent hardness.
- c) What is pitting corrosion? Explain.
- d) Explain the corrosion taking place in acidic medium.
- e) Draw the phase-Diagram of water-system.
- f) Explain the laws of photochemistry.
- g) Give any one method for the prevention of corrosion.
- h) What is meant by standard electrode potential? Explain.
- i) Explain the NMR spectrum of acetone, methyl alcohol and benzene.
- j) Define chromophore and explain with examples.

### Section - B

(Marks: 8 Each)

Q2) What do you understand by cation and anion exchangers? Explain the removal of hardness with ion exchange method.

Q3) Give the mechanism of metal corrosion in slightly basic medium. Give some specific examples.

**Q4)** Explain the Lowry-Bronsted and Lewis concept of acid and base. Whether  $\text{BF}_3$  and pyridine is acid or base, explain.

**Q5)** Write short notes on the following:

- (a) Cathodic protection.
- (b) Atmospheric Corrosion.

### Section - C

*(Marks: 8 Each)*

**Q6)** Explain the Law of Photochemical equivalence. How quantum yield can be explained taking Law of Photochemical equivalence into consideration. Explain with some specific examples.

**Q7)** What do you mean by chemical-shift? Explain with examples the shielding and deshielding effects of halogens in case of an alkane.

**Q8)** Define Phase, component and degree of freedom. Discuss Phase-Diagram for Liquid-Solid System.

**Q9)** Write short notes on the following:

- (a) Transitions involved in UV-Spectrophotometry.
- (b) Photoelectron Spectroscopy in case of atoms and molecules.

