Roll No. | | | | | | | | | | | |

Total No. of Questions: 09 **Total No. of Pages: 02**

B.Tech. (Sem.1,2)
ENGINEERING CHEMISTRY
Subject Code: CH-101
Paper ID: A0110

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATES:

1. **Section A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **Attempt any FIVE questions from Section B & C. (each question carries EIGHT marks). Select at least TWO questions each from Section B & C.**

SECTION A

1. Compulsory Question:

a) Why do we express hardness of water in terms of $CaCO_3$, equivalents?

b) What is meant by single electrode potential?

c) What do you understand by reduced phase rule?

d) Write a note on soil corrosion.

e) What do you mean by spin-lattice relaxation in NMI?

f) List the three criteria for phase equilibrium of a multi-component system.

g) Why is it not possible to measure the limiting molar conductivity of a weak electrolyte experimentally?

h) Define quantum yield. Give its mathematical expression.

i) Discuss the principle behind liquid chromatography.

j) Define B.O.D and C.O.D.

SECTION B

2. What is boiler feed water? Explain the scale and sludge formation in boiler.

3. Explain the mechanism of electrochemical corrosion with example.

4. Explain the principle and working of TLC. List its important application s.

5. What is liquid junction potential? Derive the expression for liquid junction potential. How can it be minimized or eliminated?

SECTION C

6. What do you understand by luminescence? Briefly explain the different types of luminescence.

7. What do you mean by resolving power of a spectrometer? Explain taking the example of a prism as the dispersing element. Also explain how the resolution depends upon slit width.

8. How does absorption signal originate in NMR spectroscopy? What is meant by resonance in NMR spectroscopy'

9. Derive the criteria for phase equilibria for a multi-component system. Deduce from it, the criteria for two phase equilibria for one component system.