

Total No. of Questions: 09

B.Tech. (2010 Batch) (Sem. – 1, 2)

ENGINEERING CHEMISTRY

M Code: 54003

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. **SECTION - B & C** have **FOUR** questions each.
3. Attempt any **FIVE** questions from **SECTION B & C** carrying **EIGHT** marks each.
4. Select at least **TWO** questions from **SECTION - B & C**.

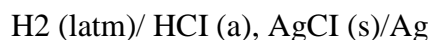
SECTION A

1.

- a) Define over-voltage. Discuss its significances or limitations.
- b) What are the differences between stable and metastable equilibrium?
- c) Define chemical actinometer with example & different types.
- d) Despite of the involvement of radiations & matter in both, what are the differences between spectroscopy and photochemistry?
- e) Discuss spin-lattice relaxations. What is their significance?
- f) What is metastable state?
- g) Give the number of components, number of phases & number of degrees of freedom in Ammonium chloride vapour, partly dissociated into ammonia and HCl.
- h) What are masers? How do they differ or relate to lasers?
- i) What is the cell reaction occurring in Weston standard cell?
- j) Define chemical shift and double resonance.

SECTION B

2. Discuss in details various parameters determining quality of water. What should be the range of those parameters for water to be used for drinking and washing purposes?
3. Discuss in details the wet corrosion. Discuss various preventive measures for various types of corrossions.
4. Write a detailed note on chromatographic development and applications of chromatography.
5. Derive Nernst equation. Calculate the mean ionic activity co-efficients of 0.1 mol/Kg HCl, given the emf of the cell



is 0.3524V and that standard electrode potential of Ag-AgCl is 0.2224V @25°C.

SECTION C

6. Describe in brief the Jablonskii's diagram and discuss various theories for mechanism of photosynthesis.
7. What are fundamental bands? Discuss Franck-Condon principle on details.
8. Give the number of lines in ESR spectrum of anthracene radical anion. Discuss MRI in details.
9. Lead (m.p. 327°C) and Silver (m.p. 961°C) form eutectic mixture at 303°C with 2.6% by weight of silver. Discuss the desilverization of lead on the basis of the phase diagram.