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B.Tech. (2008-2010 Batches) (Sem.-1,2) ENGINEERING CHEMISTRY

Subject Code : CH-101 Paper ID : [A0110]

Time: 3 Hrs. Max. Marks: 60

INSTRUCTION TO CANDIDATES:

- 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 atleast TWO questions from SECTION-B & C.

SECTION-A

1. Write briefly:

- a) Define quantum yield.
- b) What is the basic principle of Chromatography? Give various types of liquid chromatography.
- c) How will distinguish chemically between soft and hard water?
- d) Despite of the involvement of radiations & matter in both, what are the differences between spectroscopy and photochemistry?
- e) How is supercooled water an example of metastable equilibrium?
- f) Write a note on photochemistry.
- g) Give the number of components, number of phases & number of degrees of freedom in a 9M aqueous solution of sulphuric acid (partly dissociated into hydrogen, bisulphite and sulphate ions) at 1 atm.
- h) What is conductivity water? Give its uses.

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- i) What is the cell reaction occurring in Weston standard cell?
- j) What is the significance of molar extinction co-efficient?

SECTION-B

- 2. Discuss in details different methods for softening of water.
- 3. Discuss in details atmospheric, soil and dry corrosion with involved chemical equations.
- 4. Describe the instrumentation of HPLC & flow diagram of LC instruments.
- 5. Define redox indicators. What would be the pH of a 0.1M sodium acetate solution when the dissociation constant for acetic acid is 1.8×10^{-5} ?

SECTION-C

- 6. Write a detailed note on the fate of photochemically excited molecule.
- 7. What are overtones? Discuss Franck-Condon principle on details.
- 8. Give the number of lines in ESR spectrum of p-benzoquinone radical anion. Discuss NOE and spin lattice relaxation in NMR.
- 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. Sketch and explain the type of cooling curve expected for 80% by weight of silver, and for 2.6% by weight of silver.

2 | M - 5 4 0 0 3 (S1) - 2 2 2 1