**Roll No. .....** **Total No. of Pages : 02**

**Total No. of Questions : 09**

# B.Tech. (Sem.-1&2)
# ENGINEERING CHEMISTRY
## Subject Code : BTCH-101 (2011 Batch)
## Paper ID : [A1106]

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

**INSTRUCTION TO CANDIDATES :**

1. **SECTION-A is COMPULSORY.**
2. **Attempt any FIVE questions from SECTION - B & C.**
3. **Selecting at least TWO questions from SECTION - B & C each.**

## SECTION-A (10 × 2 = 20 Marks)

l. Write short notes on :

(a) What are coercing colloids?

(b) What is the difference between allowed and forbidden transition?

(c) What is the range of peak identification region in IR spectrum?

(d) Discuss metal alloys for corrosion control.

(e) Sharp peaks are seldom observed in UV spectrum. Explain.

(f) Milliequivalent per litre of hardness = _____ ppm. Explain.

(g) Give the possible electronic excitations for :

(i) $CH_2CH{=}CH_2$ (ii) $CH_3CHO$

(h) How $^1H$ NMR can be used to distinguish *p*-$CH_3C_6H_4CH_3$ from $C_2H_5C_6H_5$ ?

(i) Mention two examples of photochemical reactions having low quantum yield.

(j) What is Green Chemistry ? Why is it called so ?

## SECTION-B

2. (a) Discuss factors contributing to the broadening of a spectral line.

(b) Discuss IR spectroscopy and its applications. (4,4)

3. (a) Photobromination of cinnamic acid to dibromocinnamic acid was carried out in blue light of wavelength 440 nm at 35°C using light intensity of $1.5 \times 10^{-3}$ J per second. An exposure of 20 minutes produced a decrease of 0.075 millimole of bromine. The solution absorbed 80% of the light passing through it. Calculate the quantum yield of the reaction.

   (b) Discuss supra molecular photochemistry. (4,4)

4. (a) Explain priming and foaming in boilers

   (b) Discuss hot lime soda process of water softening. (4,4)

5. (a) Discuss the use and advantages of water and ionic liquids as solvents in organic reactions.

   (b) What are microwaves? How these waves can speed up the chemical reaction ? (4,4)

**PART - C**

6. (a) What do you understand by Galvanic corrosion ?

   (b) Explain the use of inhibitors for corrosion control. (4,4)

7. (a) What is polymerization ? Discuss its types.

   (b) Discuss polymer reinforced composites. (4,4)

8. (a) Discuss nanocrystals.

   (b) Give the applications of nanochemistry. (4,4)

9. (a) How crude oil is classified ? Discuss the production of ethylene.

   (b) Discuss natural gas liquids. (4,4)