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

Total No. of Questions : 09

B.Tech. (Sem.–1/2nd)

ENGINEERING CHEMISTRY

Subject Code : BTCH-101 (2011 & 2012 Batch)

Paper ID : [A1106]

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

INSTRUCTION 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 atleast TWO questions from SECTION - B & C.**

SECTION-A

1. Write briefly :

(i) What happens when temporary hard water is boiled? Write chemical equations.

(ii) Give two examples of monomers that will not give stereoregular polymer.

(iii) What is the origin of petroleum?

(iv) *The absorption bands in UV-visible spectra are usually broad.* Explain.

(v) Explain how rusting of iron is prevented by galvanization.

(vi) Distinguish between photochemical and thermal reactions.

(vii) Write the formula describing "risk" for exposure of chemical(s) in an industry.

(viii) What are Nanomaterials ?

(ix) Explain the process of vulcanisation of Rubber. What is its use ?

(x) Define Lambert-Beer law. (2 × 10)

SECTION-B

2. (a) What is spectroscopy? Discuss the principle and working of a spectrophotometer with the help of schematic diagram.

   (b) Explain Spin-spin splitting in NMR. (4,4)

3. (a) What is meant by quantum yield of a photochemical reaction? Explain.

   (b) Explain fluorescence.

   (c) What are optical sensors? (4,2,2)

4. (a) Discuss the treatment of ground water to be used for domestic purposes.

   (b) Give the names of three sludge forming and three scale forming compounds.

   (c) Why natural water should not be used for boilers? (4,2,2)

5. (a) *Catalytic reagents are superior to stoichiometric reagents*. Explain with the help of examples.

   (b) What do you understand by % yield in a chemical reaction? Describe the concept of % atom economy by taking examples from rearrangement reactions and substitution reactions. (4,4)

SECTION-C

6. (a) Which part of the nail, inside or outside of wood undergoes corrosion readily and why ?

   (b) Describe the mechanism of electrochemical corrosion. (4,4)

7. (a) How the molecular weight of polymer can be determined by number average method?

   (b) What are composite materials? What are the advantages and limitations of polymer reinforced composites? (4,4)

8. (a) Discuss supramolecular structures.

   (b) What do you understand by self-assembling materials? Explain. (4,4)

9 (a) What is Crude Oil? Give its composition and classification.

   (b) Describe the second generation petrochemicals. Discuss giving examples (4,4)