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

Total No. of Questions : 09

B.Tech. (2011 Onwards) (Sem.–1,2)

ENGINEERING CHEMISTRY

Subject Code : BTCH-101

Paper ID : [A1106]

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

SECTION-A

1. Write briefly :

a) Why should the presence of CO_2 be avoided in boiler feed water?

b) What do you understand by number average molecular weight of polymer?

c) What are petrochemicals? What are the primary raw materials for petrochemicals?

d) Methanol is a good solvent for UV but not for IR studies. Why?

e) Explain phosphorescence.

f) What are ionic liquids?

g) What do you understand by functionality in polymer chemistry?

h) Define nanoscience.

i) Distinguish between priming and forming.

j) Compare dry and wet corrosion.

SECTION-B

2. a) What are different kinds of electronic transitions? Explain each type with suitable examples.

   b) Explain the principle of nuclear magnetic resonance spectroscopy.

3. a) Define Beer-Lambert's law. What are its limitations?

   b) A substance when dissolved in water at 10^{-3}M concentration absorbs 10% of the incident radiation in a path of 1 cm length. What should be the concentration of the solution in order to absorb 80% of the same radiation?

4. a) What are the major disadvantages of hard water when used for :

      i) domestic purposes

      ii) industrial purposes

      iii) steam generation in boilers

   b) How is water disinfected by chlorination?

5. a) Define Green Chemistry. Explain the differences between traditional approach to reduce pollution and the Green chemistry approach.

   b) Explain usefulness of :

      i) supercritical CO_2 and

      ii) water as alternative solvents with examples.

SECTION-C

6. a) What is corrosion? Explain electrochemical theory of corrosion.

   b) Explain differential metal corrosion.

7. a) What is polymerization? Differentiate between addition and condensation polymerization. Give examples of addition and condensation polymerization.

   b) What is tacticity? How polymers are classified on the basis of tacticity?

8. a) What is self-assembly? What are its distinctive features and advantages?

   b) Discuss applications of nanomaterials in medicine.

9. a) Discuss briefly the natural gas treatment processes. Illustrate with the help of diagram.

   b) Discuss cracking and purification for the production of ethylene.