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**B.Tech. (Sem. – 1<sup>st</sup>)**  
**ENGINEERING CHEMISTRY**  
**SUBJECT CODE : BTCH – 101 (2011 Batch)**  
**Paper ID : [A1106]**

Time : 03 Hours

Maximum Marks : 60

**Instruction to Candidates:**

- 1) Section A is **compulsory**.
- 2) Attempt any **Five** questions from Section B & C.
- 3) Selecting atleast **Two** questions from Section B & C.

**Section - A****Q1)****(2 marks each)**

- a) How the use of ultrasonic radiation can help in green syntheses?
- b) A copper equipment should not possess a small steel bolt. Explain.
- c) What are third generation petrochemicals?
- d) What is standard hard water?
- e) What is meant by polymerization?
- f) State Beer – Lambert law.
- g) How scale formation in boilers can be prevented?
- h) Hydrogen chloride can undergo stretching vibration only, while carbon dioxide can undergo stretching and bending vibrations. Explain.
- i) What is nanochemistry?
- j) What is meant by shielding and deshielding of a proton nucleus?

**Section - B****(8 marks each)**

- Q2)** (a) Discuss the principle of UV/Visible spectroscopy.
- (b) Draw and explain  $^1\text{H}$  NMR spectrum pattern for  $\text{Cl}_2\text{CH-CHCl-CHCl}_2$ .

- Q3)** (a) Draw well labeled Jablonski diagram. Discuss non-radiative transitions.  
(b) Describe photovoltaic cells.
- Q4)** (a) What are the disadvantages of sludge formation? How it can be prevented?  
(b) Discuss hot lime soda process for softening of water. What are its advantages and disadvantages?
- Q5)** (a) Define Green Chemistry. What do you understand by atom economy?  
(b) Explain the design of safer chemicals by giving examples.

### Section – C

*(8 marks each)*

- Q6)** (a) Discuss mechanism of wet corrosion.  
(b) What do you understand by corrosion and stress corrosion?
- Q7)** (a) What types of intermolecular bonds are present in polymers? Explain.  
(b) What do you understand by tacticity in polymers? Explain different types.
- Q8)** (a) What do you understand by two dimensional assemblies?  
(b) Explain supramolecular structures.
- Q9)** (a) Discuss natural gas. Discuss its treatment processes.  
(b) Discuss the production of ethylene and propylene.

