

**BTCH101 Engineering Chemistry**

Time: 3 Hrs

Max Marks: 60

Note: Attempt six questions in all. Question number 1 is compulsory. Candidate is required to attempt another five questions from Part-A and B by selecting at least two from each part.

1. (a) What is the purpose of using TMS in recording  $^1\text{H}$  NMR spectrum?
- (b) What is soft water? Where it is required?
- (c) State the law of photochemical equivalence.
- (d) Discuss the concept of atom economy.
- (e) What do you understand by functionality in polymer chemistry?
- (f) The  $^1\text{H}$  NMR spectrum of  $\text{C}_2\text{H}_4\text{Br}_2$  has only one signal. What could be its structure?
- (g) What is a chromophore and auxochrome?
- (h) What are nanomaterials?
- (i) Give the constituents of natural gas and their %age.
- (j) What is thermal cracking?

(2 x 10)

**PART - A**

2. (a) Explain the principle of NMR spectroscopy?
  - (b) What information can be obtained from the UV-Vis spectrum?
- (5,3)
3. (a) Define quantum yield. Photochemical reactions can show quite high or low quantum yields. Explain.
  - (b) Explain photovoltaic cells.
- (4 x 2)
4. (a) What are the specifications for boiler feed water?
  - (b) Discuss the hot lime-soda process for softening of water.
- (4 x 2)
5. (a) Explain the concept of alternative solvents in Green Chemistry.
  - (b) Elaborate the concept of design of safer chemicals with suitable example.

(4 x 2)

**PART-B**

6. (a) Differentiate wet corrosion from dry corrosion.
  - (b) What do you understand by Galvanic series. How it is useful?
- (4 x 2)
7. (a) How the number average molecular weight of the polymer can be determined?
  - (b) What is polymerization? Describe the types of polymerization.

(4 x 2)

8. (a) How the physical and chemical properties of nanoparticles vary with size?  
(b) Explain supramolecular structures. Give applications of materials having supramolecular structures. (4 x 2)
9. (a) Discuss various generations of petrochemicals.  
(b) Discuss the production of ethylene. Give its uses. (4 x 2)

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