

Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

**B.Tech. (Automation & Robotics/Bio Technology/Civil  
Engineering/Computer Science & Engineering/Electrical & Electronics  
Engineering/Electrical Engineering/Electronics & Communication  
Engineering/Information Technology/Mechanical Engineering)  
(Sem.-1,2)**

**ENGINEERING CHEMISTRY**

**Subject Code : BTCH-101**

**M.Code : 54093**

**Date of Examination : 08-07-22**

**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 Each.

**SECTION-A**

**Answer briefly :**

- 1) What is the importance of 'finger print region' in infrared spectroscopy?
- 2) What is Lambert-Beer's Law?
- 3) Distinguish between hard water and soft water.
- 4) Write down the properties of water to be used as green solvent.
- 5) The observed chemical shift of a proton is 350 Hz from TMS and the operative frequency of NMR spectrometer is 100 MHz. Calculate the chemical shift in  $\delta$  ppm.
- 6) What is calgon conditioning of boiler feed water?
- 7) What is meant by polymer reinforced composite?
- 8) Why does the small anodic area result in intense corrosion?
- 9) What are natural gas liquids?
- 10) What are nonmaterial's?

## SECTION-B

- 11) a) Why molecules absorb in UY-Visible region? What are the types of electronic transitions that can occur in a molecule? Explain giving examples.
- b) What is the principle of IR spectroscopy? Calculate the fundamental modes of vibrations in  $C_6H_6$  and  $CH_4$  molecules.
- 12) a) What is meant by quantum yield of a photochemical-reaction? How would you explain very high and very low quantum yields of some photochemical reactions?
- b) Differentiate between fluorescence and phosphorescence.
- 13) a) Explain the desalination of water by reverse osmosis method.
- b) Differentiate between scale and sludge. How are scales formed? What are their disadvantages?
- 14) a) Name the twelve principles of green chemistry. Explain the use of innocuous reagents in green synthesis.
- b) How can the ultrasonic radiations be used to carry out the green chemical synthesis? Explain by taking a suitable example.

## SECTION-C

- 15) a) What is differential aeration corrosion? Illustrate the reactions involved in differential aeration corrosion with reference to iron materials.
- b) What are the different methods of controlling corrosion? Explain sacrificial anodic protection method.
- 16) a) Differentiate between addition polymerisation and condensation polymerization with suitable examples.
- b) '*Weight average molecular weight is higher than number-average molecular weight of a polymer*'. Explain.
- 17) a) What are the characteristics of self assembly? Explain the formation of self assembled monolayers.
- b) What are coercing colloids? Give its applications.
- 18) a) What is the composition of crude oil? Also, classify the crude oil in different categories.
- b) Describe the catalytic cracking of crude petroleum oil.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**