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 δ 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.