

Roll No.

Total No. of Pages : 02

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B. Tech. (AE/ AI & ML/EEE/ CE/ CSE/ EE/ ECE/ IT/ ME/ Internet of Things and Cyber Security including Block Chain Technology) (Sem.-1,2)

CHEMISTRY-I

Subject Code : BTCH-101-18

M.Code : 75343

Date of Examination : 29-05-2025

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 at least TWO questions from SECTION - B & C.

SECTION - A

1. Answer briefly :

- What are dipole-dipole interactions? Explain.
- Give one example of hard and soft acid.
- Why TMS is used as an internal standard in NMR Spectroscopy?
- What is Dry corrosion? Explain.
- What is Markownikof's rule? Explain by giving example.
- Differentiate between ionization Isomerism and Hydrate Isomerism.
- Which of the following will show IR spectrum?

O₂, N₂, H₂, CO₂

- h. How is entropy related to free energy?
- i. Calculate the bond order of O_2 and O_2^+ .
- j. What is absolute configuration?

SECTION - B

2.
 - a. Draw the molecular orbital energy level diagram of CO molecule.
 - b. Differentiate between n-type and p-type semiconductors.
3.
 - a. Discuss in detail Crystal field splitting in octahedral complexes.
 - b. What is Aufbau Principle?
4.
 - a. Explain the process of Fluorescence and phosphorescence with the help of Jablonski diagram.
 - b. Differentiate between scattering and diffraction.
5.
 - a. Derive expression for the calculation of V_c , P_c and T_c in terms of van der waal's constant.
 - b. Explain the deviation of real gases from ideal behavior.

SECTION - C

6.
 - a. What is corrosion? Discuss mechanism of dry corrosion.
 - b. Calculate the emf of the cell $\text{Zn} / \text{Zn}^{2+} (0.001\text{M}) \parallel \text{Cu}^{2+} (0.1\text{M}) / \text{Cu}$. The standard potential of Cu/Cu^{2+} half-cell is +0.34 V and Zn/Zn^{2+} is 0.76 V.
7.
 - a. What is ionization energy? Which elements have the highest ionization energy? How ionization energy shows variation along the period and down the group?
 - b. What is the difference between oxidation number and oxidation state?
8.
 - a. Describe the conformational analysis of butane.
 - b. What is enantiomerism? Explain the requirement for enantiomerism.
9. Explain the following terms :
 - a) Elimination reaction with mechanism.
 - b) Ring Cyclization reaction.

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.