Roll No. | | | | | | | | | | | | | **Total No. of Pages : 03**

Total No. of Questions : 09

B.Tech. (Electrical Engg.) (Sem.–1)

CHEMISTRY-I

Subject Code : BTCH-101B

M.Code : 76281

Date of Examination : 14-01-2023

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.**

SECTION-A

1. Write short notes on:

a) What is Aufbau Principle? Explain.

b) What are dipole-dipole interactions? Explain.

c) What is electrochemical corrosion? Give examples.

d) What type of molecules show IR Spectra?

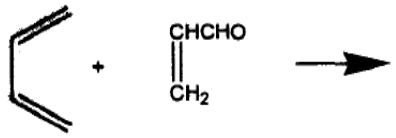
e) Differentiate between P- type and N-type semiconductors.

f) Why electron affinities of halogens are the highest?

g) What is principle of HSAB?

h) What is the difference between linkage isomerism and co-ordination isomerism?

i) Complete the following:



j) How is entropy related to free energy?

SECTION-B

2. a) Draw the molecular orbital energy level diagram of NO molecule?

   b) Find out the bond orders of CO, N_2 and O_2^2?

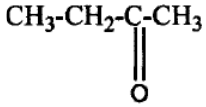
3. a) Discuss in detail Crystal field splitting in octahedral complexes?

   b) What is Pauli Exclusion Principle? Explain.

4. a) What is Fluorescence? Discuss its applications in medicines.

   b) How many signals are present in following compounds:

   i) CH_3-O-CH_3

   ii) 

   iii) CH_3-CH_2-O-CH_2-CH_3

   iv) CH_3-CH-Br_2

5. a) What are van der Waals forces? Discuss them briefly.

   b) What do you understand by potential energy surface? Explain with an example.

SECTION-C

6. a) Derive Nernst equation for calculation of cell e.m.f.

   b) What is Ellingham Diagram? How it can be constructed? What are the important characteristics?

7 a) What is ionization energy? Which elements have the highest ionization energy? How it shows variation along the period and down the group?

   b) Write short notes on the following :

   i) Effective Nuclear Charge

   ii) Penetration of molecular orbitals.

8. a) Describe the conformational analysis of butane.

   b) Draw structural isomers for C_3H_8O and $C_4H_{10}O$?

9. a) Write short notes on the following organic reactions:

   i) Oxidation reactions

   ii) Ring opening reactions

   b) What are Elimination reactions? Give its mechanism.

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