

Roll No.

Total No. of Pages :03

Total No. of Questions : 09

B.Tech. (AI&DS/M.L./Block Chain/CE/CSE/EE/EEE/ECE/Cyber Security/E&TE/FT/IT/ME/Internet of Things and Cyber Security including Block Chain Technology) (Sem.-1)

CHEMISTRY-I

Subject Code : BTCH101-23

M.Code : 93800

Date of Examination: 16-12-2023

Time : 3 Hrs.

Max. Marks : 60

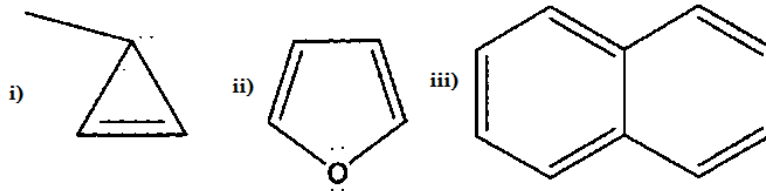
INSTRUCTIONS TO CANDIDATES :

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 briefly :

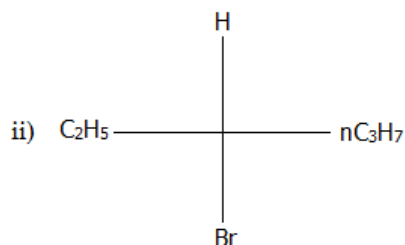
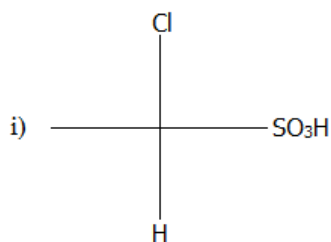
- a) What are N type and p-type semiconductors?
- b) What are Chromophores? Give examples.
- c) Out of the following compounds write which are aromatic or antiaromatic.



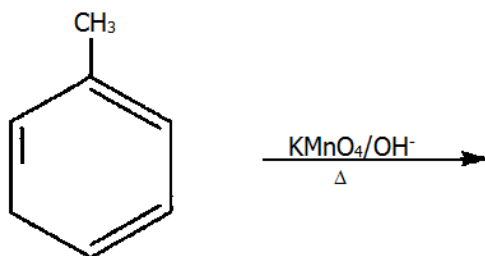
- d) Distinguish between an Ideal gas and Real gas.
- e) What is electrochemical corrosion? Discuss.
- f) What is Markownik of Rule? Give an example.
- g) What is Lewis concept of Acids and Bases?

h) Why electron affinity of noble gases are Zero?

i) Assign R/S configuration to each of the following compounds.



j) Complete the following reaction:



SECTION-B

2. a) Explain crystal field theory in detail. How it can be utilized in explaining the octahedral complexes of transition metal ions.

b) Differentiate between bonding and antibonding molecular orbitals.

3. **Define the following terms:**

a) Bathochromic shift b) Auxochromes c) fluorescence d) hyperchromic shift

4. Explain in detail the vander waal Equation of state for real gases.

5. a) The e.m.f. of the cell reaction $3\text{Sn}^{+4} + 2\text{Cr} \rightarrow 3\text{Sn}^{+2} + 2\text{Cr}^{+3}$ is 0.89. Calculate the standard free energy change for the reaction.

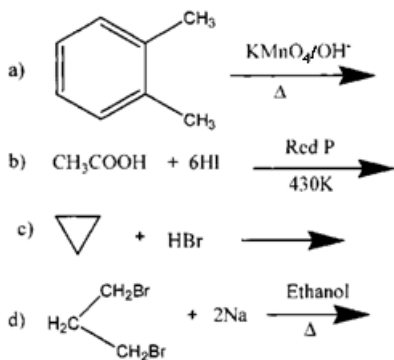
b) Discuss the Zeolite process for softening of water.

SECTION-C

6. Explain why:

- Electron affinity of fluorine is less than that of chlorine.
 - Ionisation energy decreases down the group and increases along the period.
 - Which has the smallest size (Cl or Cl⁻) and why?
7. a) What is diastereomerism? Explain by giving at least two examples.
b) Discuss the conformational analysis of propane.

8. Complete the following reactions:



9. Explain the following :

- HSAB principle
- Enantiomerism
- Electronegativity
- Free energy.

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.