

H

Roll No.

TCH-101

**B. TECH. (FIRST SEMESTER)
MID SEMESTER EXAMINATION, 2019
(ALL BRANCHES)
ENGINEERING CHEMISTRY**

Time : 1 : 30 Hours

Maximum Marks : 50

Note : (i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)

(a) The bond order of NO molecule is

(b) XeF_4 molecule has hybridization.

(c) O_2 molecule is diamagnetic in nature.

(True-False)

(d) The H_2O molecule has tetrahedral shape.

(True-False)

(e) AlCl_3 is nucleophile.

(True-False)

(2)

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2. Attempt any *five* parts : (3×5=15 Marks)
- Define Nucleophiles. Give examples.
 - Draw the shape of NH_3 molecule.
 - Write a short note on Carbocations.
 - Explain, why H_2O is liquid while H_2S is gas ?
 - Write a short note on Inductive Effect.
 - Write a short note on Bond Order.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Write a short note on hydrogen bonding with its significances.
 - Draw the MOT diagram of HF molecule with its bond order and magnetic nature.
 - Differentiate between (BMO and ABMO) bonding and anti-bonding molecular orbitals.
4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Write a short note on Free radicals. Also write about its structure and stability.
 - Differentiate between the mechanisms of S_N^1 & S_N^2 reactions.

(3)

- Explain aromatic electrophilic substitution reaction with the mechanism of nitration.
5. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- Write the main postulates of VSEPR theory with the example of shape of H_2O molecule.
 - Explain Metallic bonding with the help of Electron sea theory.
 - Explain, why p-nitrophenol and o-nitrophenol has different solubility in water.

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