

**H**

**Roll No. ....**

**TCH-101**

**B. TECH. (FIRST SEMESTER)  
MID SEMESTER EXAMINATION, 2018**

**(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) MOT theory was proposed by .....

(b) O<sub>2</sub> and N<sub>2</sub> molecules are diamagnetic.

(True/False)

(c) AlCl<sub>3</sub> is nucleophile. (True/False)

(d) The bond order of Li<sub>2</sub> molecule is .....

(e) The shape of PCl<sub>5</sub> is .....

2. Attempt any *five* parts : (3×5=15 Marks)

(a) Explain about Free radicals.

(2)

TCH-101

- (b) Define Electrophiles with examples.
- (c) Write about Electromeric effect.
- (d) Write a short note on Carbenes.
- (e) Briefly write about homo and heterolytic cleavage of a covalent bond.
- (f) Write a short note on resonance in organic compounds.

**Section—B**

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Write a short note on Carbocations. Also write about its structure and stability.
  - (b) Explain Metallic bonding with the help of Electron sea theory.
  - (c) Write the main postulates of VSEPR theory with the example of shape of  $\text{NH}_3$  molecule.
4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Differentiate between bonding and anti-bonding molecular orbitals.
  - (b) Write a short note on hydrogen bonding with its classification and applications.
  - (c) Explain, why *p*-nitrophenol and *o*-nitrophenol has different solubility in water.

F. No. : b-50

(3)

5. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Explain Aromatic electrophilic substitution reaction with the mechanism of nitration of benzene.
  - (b) Write the mechanisms of  $\text{S}_\text{N}^1$  &  $\text{S}_\text{N}^2$  nucleophilic substitution reactions.
  - (c) Draw the MOT diagram of HF molecule with its bond order and magnetic nature.

TCH-101

500

F. No. : b-50