Roll No. | | | | | | | | H

TCH–201

B. Tech. (Second Semester)
Mid Semester EXAMINATION, 2017
(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 CN is .....

   (b) The hybridization in $^{+}CH_3$ (methyl carbocation) is .....

   (c) Hyperconjugation is also called ..... conjugation.

   (d) BF_3 is electrophile. (True/False)

   (e) The shape of XeF_4 is square planar. (True/False)

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

   (a) Define Electromeric Effect.

(b) What are the Nucleophiles ?

(c) Write a short note on Carbenes.

(d) Define Inductive effect with its types.

(e) Methylamine is a stronger base than ammonia. Explain why ?

(f) Explain with the reason p-nitrophenol is more soluble in water than o-nitrophenol.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)

(a) Write a short note on Hydrogen bonding with its classification and applications.

(b) On the basis of MOT theory, explain why O_2 is paramagnetic in nature.

(c) With reason arrange the following carboanions in increasing order of stability :

$$RCH_2^-, CH_3^-, R_3C^-, R_2CH^-$$

4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)

(a) Describe the structures of H_2O and NH_3 molecules in terms of VSEPR theory.

(b) Explain Aromatic electrophilic substitution reaction with the mechanism of nitration.

(c) Describe the band of metallic bond.

5. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)

(a) Draw the MOT diagram of NO with its bond order and magnetic nature.

(b) Write the mechanisms of nucleophilic substitution (SN^1 and SN^2) reactions with stereochemistry.

(c) Differentiate between bonding and antibonding molecular orbitals.

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