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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 $^+\text{CH}_3$ (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.

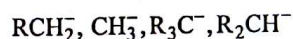
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- (b) What are the Nucleophiles ?
- (c) Write a short note on Carbenes.
- (d) Define Inductive effect with its types.
- (e) Methylamine is a stronger base than ammonia. Explain why ?
- (f) Explain with the reason p-nitrophenol is more soluble in water 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 O₂ is paramagnetic in nature.
 - (c) With reason arrange the following carboanions in increasing order of stability :



4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
- (a) Describe the structures of H₂O and NH₃ molecules in terms of VSEPR theory.
 - (b) Explain Aromatic electrophilic substitution reaction with the mechanism of nitration.
 - (c) Describe the band of metallic bond.

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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 (S_N¹ and S_N²) reactions with stereochemistry.
 - (c) Differentiate between bonding and antibonding molecular orbitals.

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