SE. Sem-III (Chem)
Engineering chemistry
~~Chem~~
Chem (Rev) III sem (32)

QP Code :NP-18631

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question No.1 is **compulsory.**
(2) Attempt any **three** questions from remaining **five** questions.

1. Answer any **four** of the following :– **20**
   (a) Explain structure of PCl_3 molecule on the basis of VSEPR Theory.
   (b) Write IUPAC names of the following co-ordination compounds :–
      (i) $Ag[(NH_3)_2]Cl$
      (ii) $Na_3[Co\ (NO_2)_6]$
   (c) Explain preparation, properties and bonding involved in $Fe_2(Co)_9$.
   (d) Explain thermodynamically and kinetically controlled reactions. Hence, explain sulphonation of naphthalene.
   (e) Discuss inductive effect and hyperconjugation with suitable example to explain the stability of carbocation.
   (f) Write a note on E_1 and E_2 reactions with mechanism.

2. (a) Explain electrophilic substitution in case of toluene. **5**
   (b) Write the chemical formula of the following co-ordination compounds – **5**
      (i) Dichloro diammine platinum (II).
      (ii) Tetrachloro cuprate (II).
   (c) Give Mechanism and applications of Reimer–Tiemann reaction. **5**
   (d) Explain Biochemistry of enzyme containing copper. **5**

3. (a) Draw molecular orbital diagram for O_2 molecule and comment on its bond order and magnetic properties. **5**
   (b) What is EAN ? Calculate EAN of $[Ni\ (CO)_4]$. **5**
   (c) Explain structure of carbon free radicals. **5**
   (d) Explain electrophilic substitution in case of chlorobenzene. **5**

4. (a) Discuss the formation of carbanions. **5**
   (b) What are the drawbacks of VBT. **5**
   (c) What is CFSE ? Calculate CFSE for d^3 and d^6 in octahedral complexes. **5**
   (d) Explain SN^2 reaction with suitable example. **5**

5. (a) Give mechanism and applications of Pinacol–Pinacolone rearrangemen. **5**
   (b) Explain oxygen transfer biomolecular reactions containing iron. **5**
   (c) Compare Bonding and Antibonding molecular orbitals. **5**
   (d) What are the drawbacks of CFT. **5**

6. (a) On the basis of MOT explain energy level diagram of NO molecule. **5**
   (b) Give mechanism and application so Wohl-Ziegler Bromination. **5**
   (c) Explain the geometrical isomerism in co-ordination compounds with respect to co-ordination no. 6. **5**
   (d) Explain Friedal craft alkylation reaction.

Course : S.E. (SEM -III) (CBSGS) (Prog-645-674)

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Correction :

Q No. (6)(b)

Read as "application of Wohl-Ziegler" Instead of "application so Wohl-Ziegler"

Q No (6)(d) also carries "5 Marks"

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