

14/5/15

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(30)

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CHEM / III / CBGS

Engg. Chem - I

QP Code : 4902

(3 Hours)

[ Total Marks : 80 ]

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

Answer any four of the following :-

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- (a) Write IUPAC names of the following co-ordinator compounds

  - $[\text{Cr Cl}_3 (\text{NH}_3)_3]$
  - $\text{Na} [\text{Mn} (\text{CO})_5]$

(b) Explain the structure of  $\text{BF}_3$  molecule on the basis of VSEPR theory.

(c) What is an elimination reaction? Discuss  $\text{E}_1$  reaction with mechanism.

(d) Explain the preparation and structure of  $\text{Fe} (\text{CO})_5$ .

(e) What is reactive intermediate? Explain with at least two examples.

(f) Explain the structure of carbon free radical.
- (a) Write the chemical formula of the following co-ordination compounds

  - Potassium tetracyanonickelate (0)
  - Triamine trinitro cobalt (III)

(b) Distinguish between  $\text{SN}^1$  and  $\text{SN}^2$  reactions.

(c) Explain the role of Fe in Haemoglobin.

(d) Draw molecular orbital diagram for CO molecule and comment on its bond order and magnetic properties.
- (a) What is CFSE? Calculate CFSE for  $d^4$  and  $d^6$  in octahedral complexes.

(b) Differentiate between bonding and antibonding molecular orbitals.

(c) Discuss inductive effect and hyper conjugation with suitable examples to explain stability of carbocation.

(d) Explain electrophilic substitution reaction wrt Friedel-Crafts alkylation.
- (a) What is EAN? Calculate EAN of  $[\text{Ni} (\text{NH}_3)_6]^{2+}$

(b) Write a note on hydrogen bonding.

(c) Explain biochemistry of enzyme containing copper.

(d) What is thermodynamically and kinetically controlled reaction? Explain with sulphonation of naphthalene.

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CHEM/III/CB

Engg. Chem

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QP Code : 4902

5. (a) Draw molecular orbital diagram for  $N_2$  Molecule and comment in its bond order and Magnetic properties. 5
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- (b) Discuss werner's theory. 5
- (c) Explain the applications of cytochromes. 5
- (d) Write pinacol - pinacolone reaction with mechanism. 5
6. (a) Explain the following terms with suitable example. 5
- (i) Co-ordination number
- (ii) Ligands
- (b) Give the drawbacks of VBT. 5
- (c) Explain electrophilic substitution in case of chlorobenzene. 5
- (d) Write the reaction and mechanism of wahl-ziegler bromination reaction. 5
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