

Exam - T0833 Sem - III  
SE/Chemical Engg. CBCGS (Rev - 2017) / T403 - Engg. Chemistry - I  
Time - 3 hrs. RP.Code - 24846 Marks - 80.

Q.No - 1 - a)  $\text{BrF}_3$  — Hybridization  
structure  $\frac{2}{2}$  marks  
explanation



b)  $\text{Fe}_2(\text{CO})_9$  — properties  $\rightarrow 2$  marks  
bonding &  $\rightarrow 3$  marks.  
structure

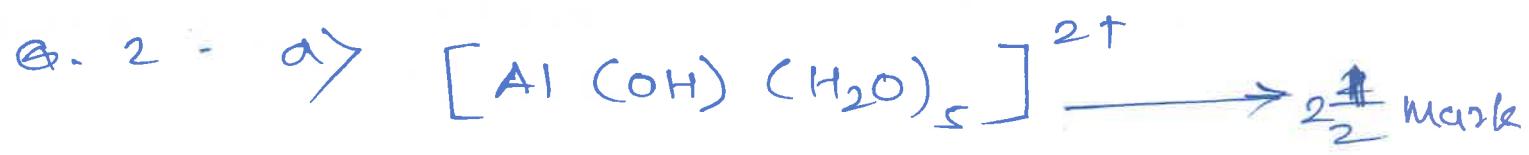
c) Tetra (ammine) (ethylene di  
amine) platinum (IV) chloride  
 $\longrightarrow 2\frac{1}{2}$  marks.

Diamido, tetra ammine cobalt (III)  
nitrate  $\longrightarrow 2\frac{1}{2}$  marks.

d) Nitration reaction  $\longrightarrow 0.1 \text{ M}$   
mechanism  $\longrightarrow 0.2 \text{ M}$   
Explanation with diagram  $\rightarrow 0.2 \text{ M}$

- e) Norrish type II reaction  
 process → 3 M  
 explanation → 2 M
- f) resonance react<sup>Nc</sup> with examples  
 → 2½ Marks

inductive effect with eg → 2½ Marks



b) O<sub>2</sub> atom transfer react<sup>N</sup> → 2 M.

explanation → 3 M.

c) Jablonski's diagram → 2 M

explanation → 3 M.

d) NO - electronic configuration → 0 M

MO - diagram → 02 M

bond order → 01 - M

Pg - 02 of 05 magnetic properties → 01 M.

Q - 3 - a) Def<sup>n</sup>-geometrical isomerism  $\rightarrow$  01 M

Pt complex with ammonia  $\rightarrow$  O<sub>3</sub>M  
structures

explanation  $\longrightarrow$  O<sub>1</sub>M.

b) five correct comparison

points bet<sup>n</sup> VBT & MOF  $\rightarrow$  5 M.

c) formation of carbanion  $\rightarrow$  3 M

structure of Carbanion  $\rightarrow$  02 M.

d) def<sup>n</sup> of carbene  $\longrightarrow$  01 M.

formation of carbene  $\longrightarrow$  04 M.

Q - 4 - a) Def<sup>n</sup> of EAN  $\longrightarrow$  01 M.

Pt(NH<sub>3</sub>)<sub>4</sub><sup>+</sup>  $\longrightarrow$  02 M

Pt - 78 +4 74 12 86 Rn.

[Fe(H<sub>2</sub>O)<sub>4</sub>]<sup>2+</sup>  $\longrightarrow$  02 M

Fe - 26 +2 24 12 36 Kr.

Q- 4 - b) Transition state & intermediate  
any five points  $\longrightarrow$  5 M.

c) sulphonation reaction  $\longrightarrow$  01 M

Mechanism  $\longrightarrow$  03 M

Explanation  $\longrightarrow$  01 M.

d) N - e<sup>-</sup> configuration - 01 M  
MO. diagram  $\longrightarrow$  03 M

~~Q-5-a)~~ stability  $\longrightarrow$  01 M.

Q-5-a) Any five points  
distinguish bet<sup>n</sup> Thermal &  
photochemical reaction  $\longrightarrow$  5 M.

b) Def<sup>n</sup> - co-ordination NO  $\longrightarrow$  01 M.  
- explanation with eg.  $\longrightarrow$  1½ M.

Def<sup>n</sup> - Ligand  $\longrightarrow$  01 M.

Explanation with  
diff. types, examples.  $\longrightarrow$  1½ M.

Q-5- c - Any five applications → 5 M

d - Def<sup>n</sup> with eg. → 02 M

Mechanism & appl<sup>n</sup> → 03 M

Q- 6 - a) Def<sup>n</sup> of carbene → 1 M

Comparision (any five points)

with str. & bond angle → 04 M

b) octet rule → 01 M.

exceptions with examples → 04 M.

c) observations of Werner's Theory → 02 M

Application in Co(III) ammine → 03 M

d) Def<sup>n</sup> of Witt-Zeigler reac<sup>n</sup> → 02 M.  
with eg.

Mechanism with explanation → 03 M.

