SECTION 'C' | $4 \times 10 = 40$ |

Long Answer questions (Word limit 400-450 words.)

UNIT-I

Q. 1. Explain mechanism of Base hydrolysis reaction in octahedral complex.

OR

Explain mechanism of substitution reaction in square planar complex.

UNIT-II

Q. 2. What do you understand by Tanabe-Sugano diagrams? Draw energy diagram for d^6 and d^8 configuration.

OR

Explain magnetic properties of complexes based on CF model (crystal field model) and also explain spin free- spin paired equilibria in octahedral stereo chemistry.

UNIT-III

Q. 3. Write only two methods of preparation and two properties of Transition metal allyl complex, also explain its structure and bonding.

OR

Write notes on Transition metals compounds with bond to hydrogen, also explain its methods of preparation.

UNIT-IV

Q. 4. What do you understand by fluxionality? Explain fluxionality on $\eta 3$ Allyl complexes.

OR

Write notes on Alkyls and Aryls of Transition metals.

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ROLL NO.....

CHE. 201/22

II SEMESTER EXAMINATION, 2022

M.Sc. (CHEMISTRY)

PAPER-I

TRANSITION METAL COMPLEXES

TIME: 3 HOURS **MAX.- 80**

MIN.- 16

Note: **The question paper consists of three sections A, B & C. All questions are compulsory.**
Section A- Attempt all multiple choice questions.
Section B- Attempt one question from each unit.
Section C- Attempt one question from each unit.

SECTION 'A' | $2 \times 8 = 16$ |

Multiple Choice Questions

1. Which type of electron transfer reaction occur with no net chemical change-

(a) Inner Sphere (b) Two electron

(c) Outer Sphere (d) All type

2. In Base hydrolysis reaction of octahedral complex the mechanism will be-

(a) S_N1 (b) S_N2 (c) S_N2CB (d) S_N1CB

3. $[Ti(H_2O)_6]^{3+}$ Complex gives purple colour due to –

(a) $M \rightarrow L$ charge transfer transition

(b) $L \rightarrow M$ charge transfer transition

(c) $d \rightarrow d$ transitions

(d) Inter Ligand Transitions

4. In which diagram the energies E/B of the levels of a d^n system are plotted against crystal field strength Dq/B -

(a) Orgel diagram (b) Correlation diagram

(c) Tanabe-Sugano diagaram (d) None of above

5. Zeise's salt is the example of –

(a) Transition metal alkene complex

(b) Transition metal alkyne complex

(c) Transition metal allyl complex

(d) Transition metal arene complex

6. The complex compounds in which H_2 molecule acts as ligand are called –

(a) Dihydride complex (b) Hydrogen complex

(c) Dihyrogen complex (d) Hydride complex

7. Organo Copper compounds are softer than Grignard's reagent because –

(a) Copper is less electropositive than Mg

(b) Copper is less electropositive than L:

(c) Copper is more electropositive than Mg

(d) Copper is more electropositive than Li

8. If two or more nuclear configurations of a molecule are chemically equivalent, The stereo chemical non-rigidity of molecule is called -

(a) Chemical equality (b) Dynamics equality

(c) Flaxionality (d) Configuration equality

SECTION 'B' $4 \times 6 = 24$

Short Answer Type Questions (Word limit 200-250 words.)

UNIT-I

Q. 1. What do you understand by Trans effect? Write two uses of trans effect.

OR

Write notes on Marcus-hush Theory.

UNIT-II

Q. 2. Write notes on selection rules.

OR

Explain spectroscopic ground states by giving examples.

UNIT-III

Q. 3. What do you understand by Transition metal arene complex? Explain structure and bonding.

OR

Write notes on the following –

(i) Zeise salt (ii) Ferrocene

UNIT-IV

Q. 4. Write notes on organo copper compounds.

OR

Write notes on Schrock Carbene complexes.