

A-0984

Total Pages : 3

Roll No.

MSCCH-506

M.Sc. Chemistry (MSCCH)

Inorganic Chemistry-II

Examination February, 2026

Time : 2:00 Hrs.

Max. Marks : 70

Note :- This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. *Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.*

Section-A

Long Answer Type Questions (2×19=38)

Note :- Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

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(1)

P.T.O.

1. What is magnetic susceptibility ? Describe the Quinckes method for the determination of magnetic susceptibility of complexes.
2. Explain the following :
 - (a) Discuss the molecular orbital diagram for octahedral complex.
 - (b) What are the normal and inverse spinel ? Explain the both type of spinel with the help of example.
3. What is the Orgel diagram ? Give the limitation of the Orgel diagram. Draw the Orgel diagram for the d^3 both tetrahedral and octahedral field.
4. What are Outer sphere reactions ? Explain Outer sphere reactions with suitable example.
5. What is the Nucleophile Substitution reaction ? Classify the nucleophilic substitution reaction. Give the mechanism of the nucleophilic substitution reaction of the octahedral complexes.

Section–B

Short Answer Type Questions (4×8=32)

Note :- Section ‘B’ contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Write short notes on the following :
 - (a) Spectrochemical series
 - (b) John teller distortion
2. What is the trans effect ? Discuss the Polarization and bonding theories of the trans effect.
3. Find the ground state term symbol for the d^3 , d^4 , d^6 and d^8 ions.
4. Why some compounds shows paramagnetic behaviour while some show diamagnetic behaviour ? Explain.
5. What do you understand by SN^1 CB mechanism ? Give suitable example.
6. Explain why the electron transfer in $[Co(NH_3)_6]^{+2} \rightarrow [Co(NH_3)_6]^{+3}$ slower than the electron transfer in $[Fe(CN)_6]^{-4} \rightarrow [Fe(CN)_6]^{-3}$.
7. Attempt any *two* of the following :
 - (a) Anation reaction
 - (b) Racah parameter
 - (c) Marcus hush theory
8. What are the selection rule for electronic spectra ?
