

Section D

8. Discuss vibrational spectra of metal carbonyls for bonding and structure elucidation. Also, discuss important reactions of metal carbonyls.

14

9. Discuss structure and important reactions of transition metal nitrosyl and dioxygen complexes.

14



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M.Sc. (NEP-2020)

EXAMINATION, 2025

(Second Semester)

CHEMISTRY

M24-CHE-201

Inorganic Chemistry-II

Time : 3 Hours]

[Maximum Marks : 70

Before answering the question-paper, candidates must ensure that they have been supplied with correct and complete question-paper. No complaint, in this regard will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Section. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) Define Molecular orbital. 2
- (b) What are Ferrimagnetic materials ? 2
- (c) Write spectrochemical series. 2
- (d) What do you mean by 'B' parameters ? 2
- (e) Calculate magnetic moment of Mn^{2+} . 2
- (f) What do you mean by transition metal ? 2
- (g) Calculate the bond-order of CO by MOT. 2

Section A

2. Discuss splitting of d -orbital in octahedral, tetrahedral and square planar complexes. 14
3. Discuss postulates of valence bond theory with suitable examples and discuss limitations of VBT. 14

Section B

4. Define Jahn-Teller effect. Also, discuss the effect of distortion on the d -orbital energy levels. 14
5. (a) With the help of Orgel diagram, discuss the electronic spectra of d^2 configuration. 7
- (b) Briefly discuss electronic spectra of molecular addition compounds of iodine. 7

Section C

6. Discuss the Gouy's method for determination of magnetic susceptibility in detail. 14
7. (a) Define magnetic exchange coupling and spin state cross over. 7
- (b) Discuss Wade's rule and discuss the structure of Zintl ions. 7