K24P 1066

Reg. No. : .....

Name : .....

Second Semester M.Sc. Degree (CBCSS – OBE – Regular) Examination, April 2024
(2023 Admission)
CHEMISTRY
MSCHE02C09/MSCHD02C09 : Inorganic Chemistry – II

Time : 3 Hours Max. Marks : 60

SECTION – A

Short answer questions (Answer **any five** questions, **each** question carries **3** marks). **(5×3=15)**

1. Discuss the limitations of Valence Bond Theory in explaining the properties of coordination compounds.
2. Describe the orgel diagram and its significance in predicting the electronic transitions of transition metal complexes.
3. Explain isomerisation reactions of metal complexes with an example.
4. Discuss various factors which determine the stability of metal complexes.
5. What role does Mössbauer spectroscopy play in the study of inorganic compounds ?
6. What information can be obtained from CHN analysis and how is it useful in determining the composition of inorganic compounds ?

SECTION – B

Paragraph questions (Answer **any three** questions, **each** question carries **6** marks. **(3×6=18)**

7. Explain the Jahn-Teller effect and its implications in coordination chemistry.
8. Discuss the importance of the spectrochemical series in predicting the relative strengths of ligands in coordination chemistry.

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9. How can charge transfer spectra be used to characterize the electronic structure of transition metal complexes ?

10. Explain associative and dissociative mechanisms with examples.

11. The proton NMR spectrum of tetramethylallenetetracarbonyliron(0) consists of a single peak at room temperature. However, at – 60°C, it consists of three independent peaks in the ratio 1 : 1 : 2. Explain.

SECTION – C

Essay–type questions (Answer **any three** questions, **each** question carries **9** marks) **(3×9=27)**

12. Explain molecular orbital theory of bonding in the complex $[CO(NH_3)_6]^{3+}$.

13. Explain the applications of magnetic measurements to structural determinations of transition metal complexes.

14. Discuss briefly the mechanism of outer-sphere electron transfer reaction. How can Marcus theory be used to explain it ?

15. Discuss the types of information obtained from UV, IR and Raman spectra of inorganic compounds.

16. Describe the Gouy method for the determination of magnetic moment value of a metal complex. Discuss the importance of Pascal's constants in this study.