

M.Sc.(Chem.) Semester - 1 (CBCS) Examination
Nov/Dec - 2022 [NEW COURSE]
INORGANIC CHEMISTRY (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

-
- Q.1 (a) Answer the following** **4 Marks**
- (1) Give the shape, B.P./L.P. and hybridization of SeCl_2 .
 - (2) Discuss the example of d-d overlapping with example and drawing.
- Q.1 (b) Answer any two questions out of three.** **10 Marks**
- (1) Draw MOT diagram and write a detailed note on bonding in NO molecule.
 - (2) Explain $[\text{Co}(\text{Cl})_4]^{-2}$ and $[\text{Co}(\text{NH}_3)_4]^{+6}$ type molecule according to VBT theory.
 - (3) Discuss the Bent rule with appropriate example.
- Q.2 (a) Answer the following.** **4 Marks**
- (1) Briefly discuss the amphoteric nature of Al.
 - (2) Briefly discuss catenation properties of group-15.
- Q.2 (b) Answer any two questions out of three.** **10 Marks**
- (1) Explain the chemical properties of oxygen group.
 - (2) Write a note on oxide and carbide of alkaline earth metal.
 - (3) Discuss the chemical properties of Nobel gas family.
- Q.3 (a) Answer the following.** **4 Marks**
- (1) Briefly Discuss linkage isomerism in metal complex.
 - (2) How negative charged metal complexes named? explain with example.
- Q.3 (b) Answer any two questions out of three.** **10 Marks**
- (1) Explain the warner theory with the help of $[\text{Pt}(\text{NH}_3)_6]^{+4}$.
 - (2) Explain the optical isomerism in 4 Co-ordination number compounds.
 - (3) What is electronic spectra of metal complexes? Discuss the spectra of d1 & d6.
- Q.4 (a) Answer the following.** **4 Marks**
- (1) How d-electron configuration effect rate of reaction in metal complex.
- Q.4 (b) Answer any two questions out of three.** **10 Marks**
- (1) What are the factor effecting substitution reaction in metal complex.
 - (2) Discuss SN_1 and SN_2 reaction in 6 C.N. complexes.
 - (3) Write a note on oxidation-reduction reaction of metal complexes.
- Q.5 (a) Answer the following** **4 Marks**
- (1) Why ^{57}Co is used for detection of iron in MB spectroscopy?
 - (2) Give the condition for recoilless emission in MB spectroscopy.
- Q.5 (b) Answer any two questions out of three.** **10 Marks**
- (1) What is quadrupole splitting in MB spectroscopy? Explain in detail with example.
 - (2) Discuss the corrosion studies by use of Mössbauer spectra of corrosion products.
 - (3) explain structural identification of carbonyl complex by use of MB spectroscopy.
