

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(Chemistry) (2015 to 2017) (Sem.-3)

INORGANIC CHEMISTRY-II

Subject Code : MSCH-301

Paper ID : [72619]

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt FIVE questions in ALL including the COMPULSORY question No.1. and selecting ONE each from Unit-I to Unit-IV.

Q1 Explain the following :

- a) Metal complexes.
- b) Oxidation state.
- c) Coordination compounds.
- d) Molecule orbital theory.
- e) Redox reactions.
- f) Lanthanidies.
- g) Carbenes.
- h) Carbides.
- i) Technetium complexes.
- j) Metal and non-metals in PET.

UNIT-I

- Q2
- a) What is transition metal chemistry? Write a detailed note on electronic configuration, general characteristic and variable oxidation states of transition metal ions.
 - b) Explain with citing examples transition metal catalysed reactions.

- Q3 a) Discuss pi-acid ligands, metal-metal bonds and quadruple bonds in detail.
b) Write note on the mechanism of inorganic reactions. What is trans effect?

UNIT-II

- Q4 a) Explain crystal field theory. Discuss the splitting of d orbitals in octahedral field.
b) What is John Teller (JT) distortion? Add note on Tanabe-Sugano diagrams.
- Q5 a) Discuss electronic spectra of coordination compounds. Write a short note on Irving William Series.
b) Give an account on electronic configuration, magnetism, electronic absorption spectra and organometallic chemistry of actinides.

UNIT-III

- Q6 a) Define organometallic chemistry. Discuss in detail structure and reactivity studies of metal carbonyls.
b) Define the term catalysis. What are homogeneous catalysts? How are they superior to heterogeneous catalysts?
- Q7 a) Write a detailed note on metallocenes and related chemistry. What are nitrosyls and metal alkyls?
b) Discuss in detail organometallic complexes with metal-metal bonds. What do you mean by dinitrogen complexes?

UNIT-IV

- Q8 a) Write a note on how inorganic compounds significant in medicine and materials. Add short note on metal complexes in display technologies. What are gold complexes?
b) What are anticancer drugs? Give a note on DNA cleavage by transition metal complexes. Write structure and uses of cisplatin.
- Q9 a) Explain Significance of metal nano-particles in heterogeneous catalysis. How metal embedded polymers valuable as functional materials?
b) Discuss molecule-based magnetic materials. What are inorganic vapochromic materials?