UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Sixth Semester – Spring 2022

Roll No. .....

Paper: Inorganic Chemistry **Course Code: CHEM-315** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions. (15x2=30)

(i) What are chelates? Name of factors which influence the stability of chelates.

(ii) What property of transition metals allows them to form the coordination compound easily?

(iii) Explain the structure of Hexa ammine cobalt (II) chloride and Hexaammineplatinum (IV).

(iv) What is the oxidation states commonly found in Actinides?

(v) What is meant by spectrochemical series?

(vi) What is the position of Lanthanides in periodic table?

(vii) Which of the complex ion namely $[Co(CN)_6]^{3-}$ and $[Co(H_2O)_6]^{2+}$ is an outer orbital complex and why?

(viii) What are the shapes of *f*-orbitals?

(ix) What is the difference in linkage isomerism and geometrical isomerism?

(x) Explain the magnetic behavior of O_2 molecule by comparing its VBT and MOT pictures?

(xi) Give two applications of metal complexes in biological systems?

(xii) What is the significance of the magnetism in determining shapes of complexes?

(xiii) How CFT is superior to VBT?

(xiv) What is stability constant?

(xv) What is the shape of AB_8 molecule according to VSEPR theory?

Q.2 Write brief answer of following. (6x5=30)

(a) What is lanthanide contraction? Why does contraction occur?

(b) Compare the properties of lanthanides and actinides. In which respect they differ from each other.

(c) Discuss shapes of AB_4, AB_2E_2 and AB_3E molecules on the basis of VBT.

(d) Write a note on four electrons three centered bonds?

(e) Draw MOT diagram of following coordination compound $[Co(NH_3)_6]^{3+}$ and $[CoF_6]^{3-}$

(f) Write note on colour properties of coordination compound?