2021
B.A./B.Sc.
Third Semester
GENERIC ELECTIVE
CHEMISTRY
Course Code: CSG 3.11
(Chemical Bonding, Transition Metals & Co-ordination Chemistry)

PART–B

Total Mark: 30

Answer the following questions.

1. Using VSEPR theory, find out the hybridization, geometry and magnetic behaviour of the following molecules 3×2=6
   (i) $AlCl_3$
   (ii) XeF_6
   (iii) CO_3^{-2}

2. (a) What are bonding and anti-bonding molecular orbitals? Why are they so called? 2
   (b) With the help of MO diagram, explain the following 2+2=4
   (i) The bond energy of NO^+ is higher than that of NO
   (ii) The bond length of CO^{+6} is larger than that of CO

3. (a) Discuss Latimer diagram of Mn. 3
   (b) Explain how the magnetic properties of lanthanoid ions differ from that of actinoid ions. 3

4. (a) Using valence bond theory, explain the following 2+2=4
   (i) $[Ni(CN)_4]^{-2}$ is diamagnetic and square planar
   (ii) $[Ni(CO)_4]$ is diamagnetic and tetrahedral
   (b) Write the IUPAC name of 1+1=2
   (i) $K_3[Fe(CN)_5CO]$
   (ii) $NH_4[Cr(NCS)_4(NH_3)_2]$

5. (a) Explain crystal field splitting of *d*-orbital in octahedral complexes. 4
   (b) Write a note on Jahn-Teller distortion. 2