

- c) What do you mean by synergic bonding in metal carbonyl? Explain? 4
- d) What is EAN rule? Calculate EAN of metal in following- 4
 i) $\text{Os}_4(\text{CO})_{16}$ ii) $\text{Ni}(\text{CO})_4$
 iii) $\text{Fe}_3(\text{CO})_{12}$
- e) Discuss the experimental evidences in support of the $d\pi-p\pi$ back bonding in metal carbonyl. 4
- f) How is vibrational spectroscopy used in explaining the strength of back π bonding in following. 4
 i) $\text{Cr}(\text{CO})_6$ ii) $\text{V}(\text{CO})_6$
4. a) Discuss the structure and bonding in metal dinitrogen complexes? 8
- b) Illustrate with appropriate example the difference between terminal and bridge bonding in nitrosyl complexes with the help of physical parameters including vibrational spectra. 8
- OR**
- c) Discuss the bonding in metal complexes. 4
- d) Discuss the various reactions that occur in metal nitrosyl (any four). 4
- e) Write a note on Vaska's complex. 4
- f) Discuss the chemistry of brown ring test with special reference to the bonding aspect of nitrosyl species? 4
5. a) What is Laporte's orbital selection rule? 2
- b) Which of the following configurations are aspected to show orbital contribution in high spin octahedral field- d^1 , d^3 , d^6 and d^8 . 2
- c) Explain bridge activated mechanism. 2
- d) Give any two-synthetic application of trans effect. 2
- e) Draw the structure of $\text{Ir}_4(\text{CO})_{12}$. 2
- f) Draw the structure of $\text{Fe}_3(\text{CO})_{12}$. 2
- g) Write a note on dioxygen complexes? 2
- h) Explain the X-ray diffraction method used metal nitrosyl complexes. 2
