



( 2 )

- (a) Explain reducible and irreducible representation. 6
- (b) Find out point group for the following compounds : 8
- (i) P-dichlorobenzene
- (ii)  $\text{ClF}_3$
- (iii)  $\text{NH}_3$
- (c) Write a note on conjugacy relation and classes. 6

**Unit-II**

2. (a) Explain the formation of  $\sigma$  bonds in any octahedral complex using MOT. 6
- (b) Write chemical reactions of sodium nitroprusside. 6
- (c) Describe molecular configuration of CO molecule as suggested by Coulson. 8

**OR**

- (a) Discuss the structure of mononuclear dioxygen complex. 6
- (b)  $\text{Fe}(\text{CO})_5$  is known while  $[\text{Fe}(\text{CO})_6]^{3+}$  is not known. Why? 6
- (c) Write the effects of  $\pi$  bonding on the value of  $\Delta_0$ . 8

( 3 )

**Unit-III**

3. (a) How does chelation affects stability of complexes ? 6
- (b) Describe the experimental determination of stability constant by spectrophotometric method. 8
- (c) Explain the types of Isopolytungstate. 6

**OR**

- (a) Write a note on properties and uses of aluminosilicates. 6
- (b) Write a note on synthesis and properties of silicones fluids and silicones rubber. 8
- (c) Give classification of heteropoly molybdate. 6

**Unit-IV**

4. (a) What are phosphazines ? Discuss nature of bond in triphosphazines. 6
- (b) What are carboranes ? Write their preparation properties and structure. 8
- (c) Write a note on Borazines. 6

**OR**

(4)

- (a) Write Wade's rule to explain the structure of closo, nido and arachno boranes. 6
- (b) Write a note on heterocatenation. 6
- (c) What are metal carbonyl clusters? Describe with suitable examples. 8
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