

Part B (40 marks)

Answer the questions only in the space provided. Attached sheets will not be graded.

1) (a) Why does $[\text{Mn}(\text{CF}_3)(\text{CO})_5]$ not react with CO?

(b) When the platinum IV complex, $[\text{PtI}_2(\text{Ph})_2(\text{PEt}_3)_2]$ is warmed in benzene it does not eliminate iodobenzene (PhI) to give Pt(II) complex, $[\text{PtI}(\text{Ph})(\text{PEt}_3)_2]$. However, it easily eliminates PhI when dissolved in MeOH. Explain why this is so.

(c) IR stretching frequencies of $[\text{Mn}(\text{CO})_6]^+$ and $[\text{V}(\text{CO})_6]^-$ are 2090 and 1860 cm^{-1} respectively. Explain.

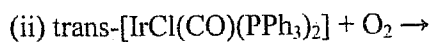
(d) What are the coordination modes of the hydride ligand?

(e) Briefly explain what is meant by polyhydrides.

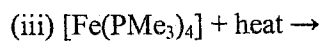
2. (a) Predict the product(s) of the following reactions using the hint given in the brackets.



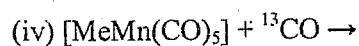
(insertion and association)



(oxidative addition)



(cyclometallation)



(insertion)

(b) Write down on the dotted line the reagent(s) which can be used to carry out the following conversions.

