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GIET UNIVERSITY, GUNUPUR - 765022
 M. Sc (Second Semester) Examinations, July - 2023
22CHPC202 - Inorganic Chemistry-II
(Chemistry)

Time: 3 hrs

Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A**(2 x 10 = 20 Marks)**

Q.1. Answer <i>ALL</i> questions	CO #	Blooms Level
a. Write note on Brown ring compounds.	CO1	K1
b. Identify the 18 electron species. $\eta^5\text{-C}_6\text{H}_5\text{Fe}(\text{CO})_2\text{Cl}$, $\eta^3\text{-C}_5\text{H}_5$, $\eta^5\text{-C}_5\text{H}_5\text{Fe CO}$	CO1	K2
c. Explain inner orbital octahedral complexes.	CO3	K1
d. Determine the structure of heteroboranes $\text{C}_2\text{B}_8\text{H}_{10}$	CO2	K2
e. What is trans effect?	CO4	K1
f. Write short note on chelate effect	CO3	K1
g. Write note on Inorganic Catenation.	CO2	K1
h. What is acid hydrolysis?	CO4	K1
i. Write a note on remote attack.	CO4	K1
j. Calculate number of skeletal electron present in $\text{C}_2\text{B}_4\text{H}_6$	CO2	K2

PART – B**(10 x 5=50 Marks)**

<u>Answer ANY FIVE questions</u>	Marks	CO #	Blooms Level
2. a. Calculation of Metal- Metal bond and structure of the following complexes (a) $\text{H}_2\text{Os}_3(\text{CO})_{10}$ (b) $\text{Co}_4(\text{CO})_{12}$ (c) $\text{Fe}_3(\text{CO})_{12}$ (d) $\text{Ir}_4(\text{CO})_{12}$	6	CO1	K2
b. Calculate the effective atomic number of single metal atom $[\text{Fe}^{2-}(\text{NO}^+)_2(\text{PR}_3)_2]$, $\text{Co}_4(\text{CO})_{12}$	4	CO1	K2
3.a. Write the preparation, properties and structure of $\text{Fe}_2(\text{CO})_9$	10	CO1	K1
4. a. Determine the structure of boron cluster B_5H_{11} , B_8H_{16} , B_5H_8^- , B_5H_9	6	CO2	K2
b. Write down the preparation of carboranes.	4	CO2	K1
5.a. Classify the following complex ions as inert or labile and how? $[\text{Ti}(\text{H}_2\text{O})_6]^{2+}$, $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$, $[\text{PtCl}_6]^{2-}$, $[\text{Ni}(\text{CN})_4]^{2-}$	6	CO3	K2
b. Explain the difference between kinetic inertness vs lability, thermodynamic stability vs instability?	4	CO3	K1

6. a.	Citing an example discuss the outer sphere mechanism of electron transfer reaction.	6	C04	K2
b.	Write down the preparation properties of Carbides.	4	CO2	K1
7.a.	Write notes on the following:	6	CO3	K1
	(a) Trans effect (b) Labile and inert complexes			
b.	Explain Marcus equation.	4	CO4	K2
8. a.	Explain Outer orbital complexes involving SP^3d^2 hybridization.	6	CO3	K1
b.	Find out the product A and B and draw the structure	4	CO4	K2
	$[PtCl_4]^{2-} \xrightarrow{+NH_3} \mathbf{A} \quad \xrightarrow{+NH_3} \mathbf{B}$			

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