BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSc **SEMESTER : IV**
BRANCH: Chemistry **SESSION : MO/2023**

SUBJECT: CH207R1 INORGANIC CHEMISTRY III

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	From valence Bond Theory predict the magnetic moment of $Co(NH_3)_6Cl_3$ and $K_3[CoF_6]$	[5]	1	Compare
Q.1(b)	Formation of $Cu(en)_3$ (where en = ethylene diamine) is energetically highly unfavorable. Explain in terms of Jahn Teller theory.	[5]	1	Explain
Q.2(a)	Discuss the properties of any one element of Group 8 (Iron group) in terms of: Electronic configuration, Ores, Extraction, Structure of any one complex(Ferrocene/carbonyls),applications, biological macromolecule and its role.	[5]	2	Explain
Q.2(b)	Discuss the d^8 arrangement for Ni(II) complexes in (a) weak and (b) strong octahedral fields? What is Wilkinson's catalyst?	[5]	2	Derive
Q.3(a)	Calculate the Crystal Field Stabilization Energy (CFSE) for the following species and find the magnetic moment: $NiCl_4$, $CrCl_3.6H_2O$.	[5]	3	Analyze
Q.3(b)	Why the absorption spectrum peaks of lanthanides are sharp, whereas that of transition metals are broad in nature.	[5]	3	Analyze
Q.4(a)	Discuss the mechanism of ion transport of sodium-potassium pump through the cell membrane. Write the reaction and its mechanism performed by carbonic anhydrase enzymes.	[5]	4	Explain
Q.4(b)	Discuss the oxygen transport process by Haemoglobin.	[5]	4	Explain
Q.5(a)	What are alpha, beta and gamma particles? Name any two radioactive elements and any one decay series?	[5]	5	Relate
Q.5(b)	Explain (a) Isomeric transitions (b) Auger effect	[5]	5	Explain

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