

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID-SEMESTER EXAMINATION SP/2024)

CLASS: IMSc
BRANCH: Chemistry

SEMESTER: IV
SESSION: SP/2024

SUBJECT: CH207R1: INORGANIC CHEMISTRY-III

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

			CO	BL								
Q.1(a)	Write the basic postulates of Warner's Coordination Theory	[2]	1	1								
Q.1(b)	Find the primary and secondary valency of Co in $\text{Co}(\text{NH}_3)_4\text{Cl}_3$, if the complex produce 1 equivalent of AgCl on treating with AgNO_3 .	[3]	1	2								
Q.2(a)	Give example of the following: chelating ligand, bridging ligand, ambidentate ligand, trigonal bipyramidal complex	[2]	2	1								
Q.2(b)	According to Valence Bond Theory, differentiate between the complexes: K_3CoF_6 and $\text{Co}(\text{NH}_3)_6\text{Cl}_3$	[3]	2	2								
Q.3(a)	Write first transition series of d block elements with their electronic configuration?	[2]	2	2								
Q.3(b)	Explain the phenomenon of d-d transition or charge transfer in transition metal complexes with examples?	[3]	2	2								
Q.4(a)	For any one element in Scandium group, mention the following: (i) Ore (ii) Separation/extraction technique (iii) Uses	[2]	2	2								
Q.4(b)	Why is Titanium called 'wonder metal'? Discuss its extraction by named process, structure of a common complex and application as a named catalyst?	[3]	2	2								
Q.5(a)	Match the following	[2]	3	1								
	<table><tr><td>i). Anti-cancer drug</td><td>a) Lithium carbonate</td></tr><tr><td>ii). MRI contrast agents</td><td>b) Auranofin</td></tr><tr><td>iii). Treatment of the manic phase of bipolar disorder</td><td>c) Gadolinium</td></tr><tr><td>iv). Antiarthritic drug</td><td>d) Cisplatin.</td></tr></table>	i). Anti-cancer drug	a) Lithium carbonate	ii). MRI contrast agents	b) Auranofin	iii). Treatment of the manic phase of bipolar disorder	c) Gadolinium	iv). Antiarthritic drug	d) Cisplatin.			
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Q.5(b)	<div><div>i) Which metal is present at the active site in urease protein and vitamin B_{12}?</div><div>ii) Give two examples of amino acids that contain sulfur atom in their backbone and also draw its structure.</div><div>iii) What is metallome? Give two examples of Metal-containing electron transfer proteins.</div></div>	[3]	3	2								

:::21/02/2024 M:::