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

CLASS: IMSC **SEMESTER: III**
BRANCH: CHEMISTRY **SESSION: MO/2022**

SUBJECT: CH201R1 INORGANIC CHEMISTRY-II

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

				CO	BL
Q1	(a)	Hydrogen fluoride acts as an acid in anhydrous sulfuric acid and as a base in liquid ammonia. Give the equations for both reactions.	[1]	CO2	1
Q1	(b)	How aqua acid is different from hydroxoacids and oxoacids? Give one example in each case.	[2]	CO1	1
Q1	(c)	Explain the solvent system definition of acid and base. Write the auto-ionization of BrF_3 and predict whether BrF_2AsF_6 is acid or base if it is soluble in BrF_3 solvent.	[2]	CO2	2
Q2	(a)	Explain- All Bronsted bases are Lewis bases but all Bronsted acids are not Lewis's acids.	[2]	CO2	2
Q2	(b)	With a proper explanation predict whether the equilibrium constants for the following reactions should be greater than 1 or less than 1.	[3]	CO2	3
		(i) $CdI_2(s) + CaF_2(s) \rightleftharpoons CdF_2(s) + CaI_2(s)$			
		(ii) $[CuI_4]^{2-}(aq) + [CuCl_4]^{3-}(aq) \rightleftharpoons [CuCl_4]^{2-}(aq) + [CuI_4]^{3-}(aq)$			
		(iii) $NH_2^-(aq) + H_2O(l) \rightleftharpoons NH_3(aq) + OH^-(aq)$			
Q3	(a)	Why isotopes of hydrogen shows greater differences in physical and chemical properties than other elements?	[2]	CO3	1
Q3	(b)	Draw a born Haber like cycle for the acidic and hydridic behavior of H_nX (X = alkali metal or halogen). Write corresponding expression of heat of formation.	[3]	CO3	2
Q4	(a)	Explain - Except Li, all other alkali metals can form superoxide.	[2]	CO3	1
Q4	(b)	With suitable example discuss Nuclear Spin Isomerism.	[3]	CO3	2
Q5	(a)	Instead of highest ionization energy among the alkali metals, Li has the lowest standard reduction potential – Explain.	[2]	CO3	1
Q5	(b)	Discuss the color, magnetism and electrical conductance for Na in liquid ammonia.	[3]	CO3	2

:::::: 27/09/2022 M ::::::