<b>TT</b> '	Inorganic chemistry (CHOICE BASED CRED	y II [CH DIT SYS	M 5201 TEM - 2	] 2021)	~		7 3 6		<b>`</b>	
Tir No	te (i) Answer ALL questions Date: 22-5-202	23				MAZ	<u>х. М</u>	ARKS: 50	)	
	(ii) Draw diagrams, and write equations wherever r	necessar	у					Montro	<u> </u>	
1A	What are the characteristics of an ideal detector for gas chromatography? With a schematic diagram explain any two types of detectors used in GC.							3	CO4	ы 1
1B	Explain the origin of Jahn-Teller distortion by CFT. What are the conditions of J.T. distortions in the octahedral complexes? Illustrate with example for tetragonal elongation.							3	CO1	2
1C	(i) TGA studies reveal that $MgC_2O_4$ exists as MgO a CaCO <sub>3</sub> between 398 <sup>0</sup> C and 420 <sup>0</sup> C and CaCO <sub>3</sub> change <sup>0</sup> C. A mixture of CaC <sub>2</sub> O <sub>4</sub> and MgC <sub>2</sub> O <sub>4</sub> obtained from 0 weighed 0.24 g at 500 <sup>0</sup> C and 0.1696 g at 900 <sup>0</sup> C res and % MgCO <sub>3</sub> in the original sample of dolomite. (A respectively)	above 4 es to Ca 0.35 g do pectivel .t. wt. of	80 °C. O betw blomite y. Calc Ca and	CaC <sub>2</sub> C een 66 (CaC culate d Mg	$D_4 ch 50 {}^{0}C O_3 + 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 $	ange and MgC 6 Ca 0 and	s to 840 2O <sub>3</sub> ) 2O <sub>3</sub> 1 24	4	CO4	4
	(ii) Explain the origin of low-spin and high-spin comp	olexes.							CO1	
2A	Write short notes on: (i) Plate theory (ii) Eddy diffusion (iii) Longitudinal d	iffusion						3	CO4	1
2B	<ul> <li>Give reasons the following:</li> <li>(i) [Fe(H<sub>2</sub>O)<sub>6</sub>]<sup>3+</sup> and [Cr(H<sub>2</sub>O)<sub>6</sub>]<sup>3+</sup> are equally stable thermodynamically but the former is labile whereas the latter is inert.</li> <li>(ii) Both [Fe(CN)<sub>6</sub>]<sup>4-</sup> and [Fe(H<sub>2</sub>O)<sub>6</sub>]<sup>2+</sup> appear colourless in dilute solutions.</li> <li>(iii) The nephelauxetic effect for ammonia is less than that for CN<sup>-</sup>.</li> </ul>							3	C01	5
2C	<ul> <li>(i) Describe softening of water by ion exchange demineralization process.</li> <li>(ii) Discuss the following type of isomerism shown by co-ordination compound with suitable examples:</li> <li>(a) Ionization (b) Solvate (c) Linkage (d) ligand</li> </ul>							4	CO4	2
3A	A solution of 6.0 g of substance A in 50 mL of aqueous solution at 20°C is in equilibrium, with a solution of A in ether containing 108 g of A in 100 mL. Calculate the amount of A extracted by shaking 100 mL of an aqueous solution containing 10 g of A with (a) 100 mL of ether (b) 50 mL of ether twice.								CO4	3
3B	<ul> <li>i) Give Reason: Calculated magnetic moment of Co<sup>2+</sup> i moment is 4.3-5.2</li> <li>ii)Explain the factors affecting lability of complexes?</li> </ul>	is 3.87, v	whereas	s obsei	rved 1	magn	etic	3	CO1	4

**3C** i) List any four metal containing enzymes and proteins along with their biological roles. 4 CO2 2 Page **1** of **2** 

	ii) Explain the function of coenzyme B12 in the conversion of diol to aldehyde.			
<b>4</b> A	What is Bohr's effect? How does it affect the saturation curve of hemoglobin and myoglobin?	3	CO2	2
<b>4B</b>	What is the need of iron storage and transport proteins? Explain their structural features.	3	CO2	2
4C	<ul> <li>i) Give reason:</li> <li>a) High vacuum environment is required in electron microscope.</li> <li>b) X ray diffraction study cannot be used for lighter elements.</li> <li>ii) What do you mean by detoxification? Explain the function of cytochrome P 450 in it.</li> </ul>	4	CO3	2
5A	What is tunneling effect? Explain the working of tunneling electron microscope.	3	CO3	2
5B	Explain screw axis symmetry with an example. List the possible screw axis symmetries.	3	CO3	2
5C	<ul> <li>i) In a cubical crystal, the first order diffraction angle for (112) plane is 18 <sup>0</sup> 20 ' when a X ray wavelength 154.1 pm is used. Calculate the dimension of (112) plane and the volume of the unit cell</li> <li>ii) Discuss the principle of X ray and Augur electron spectroscopy.</li> </ul>	4	CO3	2

\*\*\*\*\*