B.S P. Pages : 2 Time : Three Hours			Sc. 4510 - Chemistry : Paper-I (Inorganic Chemistry) GUG/W/18 * 1 0 5 1 * Max. Mar	ic Chemistry) GUG/W/18/1338 Max. Marks : 50	
	Not	es: 1. 2.	All five questions are compulsory and carry equal marks. Write chemical reaction and draw diagram wherever necessary.		
1.	a)	Discuss	the factors affecting the magnitude of 10 Dq.	5	
	b)	Explain	the electronic spectrum of $[Ti(H_2O)_6]^{3+}$ complex ion in detail.	5	
			OR		
	c)	Calculat complex Giv [Co(NH	e the crystal field stabilization energy for high spin and low spin octahedral of Co ⁺³ with NH ₃ ligand. The that mean pairing energy is 21,000 cm ⁻¹ and Δo for ${}_{3})_{6}]^{3+} = 23,000 \text{ cm}^{-1}$ Predict the spin state of the complex.	21/2	
	d)	Explain	the splitting of d-orbital is tetrahedral complexes.	21/2	
	e)	Explain	Jahn Teller effect with suitable example.	21/2	
	f)	Write th	e sailent features of crystal field theory.	21/2	
2.	a)	Discuss	the spin only formula and orbital contribution to the magnetic moment.	5	
	b)	Explain	stepwise and overall stability constant. Derive the relationship between them.	5	
			OR		
	c)	Describe	e the Gouy's method for the determination of magnetic susceptibility.	21/2	
	d)	Discuss	the magnetism for d^4 , d^5 and d^6 octahedral complexes with respect to CFT.	21/2	
	e)	Discuss	the effect of chelation on stability of complex.	21/2	
	f)	Describe complex	e the Job's method for the determination of composition of Fe (III)- SSA	21/2	
3.	a)	Draw a v in quant	well labelled diagram of double beam spectrophotometer. Discuss its application itative analysis with reference to estimation of Cu(II) as Cu - ammonia complex.	5	
	b)	What is mixtures	ion exchange chromatography? Discuss its application in separation of binary s.	5	
			OR		

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	d)	Discuss the double beam photoelectric colorimeter with well labelled diagram.				
	e)	Explain the factors affecting the solvent extraction.				
	f)	Discuss the principle and technique involved in column chromatography.	21/2			
4.	a)	Explaini) Metal ethylenic complex.ii) Homogeneous hydrogenation.	5			
	b)	Draw the structure of hemoglobin and myoglobin. Explain their role in transport of oxygen in detail.	5			
	c)	What is organometallic compound? Discuss the structure of trimethyl aluminum.	21/2			
	d)	Discuss the biological role of Ca^{2+} metal ion.				
	e)	State the different types of soil. Explain how soil sample is collected for analysis.				
	f)	Describe the method of analysis for i) Soil pH ii) Soil salinity.	21/2			
5.		Attempt any ten.				
		i) Draw the splitting of d-orbital in square planar complex.				
		ii) State spin selection rule.				
		iii) Write any two limitations of valence bond theory.				
		iv) Calculate the magnetic moment for Fe^{+3} ion.				
		v) What is thermodynamic and kinetic stability?				
		vi) Define labile and inert complex.				
		vii) Define ion exchange capacity.				
	viii) Calculate R_f value for Ni ²⁺ and Cu ²⁺ if distance travelled by solvent, Ni ²⁺ and Cu ²⁺ are 8.8 cm, 0.5 cm and 7.5 cm respectively.					
		ix) Define molar extinction coefficient.				
		x) Name the following organometallic compounds a) C_2H_5BeH b) $(CH_3)_4Pb$				
		xi) What is $Na^+ - K^+$ pump?				
		xii) Define entisols.				
