B.Sc. (CBCS Pattern) Sem-III USCCHT05 - Chemistry- I : Paper-I : Inorganic Chemistry

P. P Tim	Pages : ne : Th	2 ree Hours $\star 3750 \star$	GUG/W/22/11600 Max. Marks : 50
	Note	 es: 1. All five questions are compulsory and carry equal marks. 2. Write chemical equation and draw diagram whenever necessary. 	
1.	a)	What are Borazine? Discuss the Structure and Bonding of Borazine.	5
	b)	What is Interhalogen compound? Explain the Structure and Bonding of fo i) CIF ii) IF ₅ OR	llowings. 5
	c)	What is carbides? Describe classification of carbides.	21/2
	d)	Describe the preparation and structure of Marshal Acid.	21/2
	e)	Give classification of Polyhalides.	21/2
	f)	Explain the Cradle shaped structure of Sulphur tetranitride (S_4N_4) .	21/2
2.	a)	What is the Lattice energy? Describe the Born-Haber cycle used for findinenergy of NaCl solid.	ng the lattice 5
	b)	What is metallic bond? Explain free electron theory for metals.	5
		OR	
	c)	Explain Bronsted – Lowry concept of acid and base.	21/2
	d)	Discuss limitations of Radius ratio rule.	21/2
	e)	What is Polarization of ions? Discuss Fajan's Rule with example.	21/2
	f)	Define the term "Solvation energy". What are the factors affecting solvati	on energy? $2^{1/2}$
3.	a)	Discuss first transition series with respect to their Electronic configuration potential.	and ionization 5
	b)	 Discuss the comparative study. i) Cr, Mo and W with respect to Stereochemistry. ii) Ni, Pd and Pt with respect to Oxidation state. 	5
		OR	
	c)	Discuss elements of first transition series with respect to Complex formation	ion tendency. $2^{1/2}$
	d)	Discuss the elements of first transition series with respect to variable Oxic	lation states. $2^{1/2}$
	e)	Discuss the electronic configuration of second transition series elements.	21/2
	f)	Discuss Fe, Ru and Os with respect to oxidation states.	21/2

4.	a)	What is the lanthanide contraction? What are the causes and consequences of lanthanide contraction.				
	b)	Exp i) ii)	lain actinide series elements with respect to Electronic configuration. Atomic and ionic radii.	5		
			OR			
	c)	Discuss electronic configuration of lanthanides.				
	d)	Describe ion exchange method for separation of lanthanide.				
	e)	Discuss lanthanides with respect to their complex formation tendency.				
	f)	Write note on position of actinide in periodic table.				
5.		Atte	empt any ten questions.	1x10 =10		
		i)	Draw the structure of diborane.	-		
		ii)	Draw the structure of ICI_4^-			
		iii)	What are silicates?			
		iv)	Draw band structure of conductor.			
		v)	Define Coordination number.			
		vi)	Define solvation energy.			
		vii)	Write electronic configuration of Ru.			
		viii)) Why Cu ²⁺ coloured and paramagnetic?			
		ix)	Calculate the Magnetic moment of Mn^{2+} ion.			
		x)	Name any two important minerals of lanthanides.			
		xi)	What do you mean by transuranic elements?			
		xii)	Why Zn and Hf are called twins elements?			
