## B.Sc. (CBCS Pattern) Sem-I USCHT01 - Chemistry-I : Inorganic Chemistry

	ages : e : Th	2 ree Hours $\star 2 2 0 9 \star$	GUG/W/22/11544 Max. Marks : 50
	Note	<ul> <li>s: 1. All questions are compulsory.</li> <li>2. Draw diagram wherever necessary.</li> <li>3. Use of calculator is permitted.</li> </ul>	
1.	a)	<ul><li>Write a note on</li><li>i) De-Broglie Idea of matter wave</li><li>ii) Heisenberg uncertainty principle.</li></ul>	5
	b)	What do you mean by Ionization energy? State factors affecting on it and IE in group as well as period.	variation of 5
		OR	
	c)	Give limitations of Bohr's theory.	2 1/2
	d)	State and explain Hund's rule of maximum multiplicity.	2 1/2
	e)	Electron affinity of fluorine is less than that of chlorine. Explain.	2 1/2
	f)	Calculate effective nuclear charge for 35 electron of Mg (At. No. of $Mg =$	= 12) <b>2</b> <sup>1</sup> / <sub>2</sub>
2.	a)	Discuss various rules of VSEPR theory and explain shape of $NH_3$ moleculars basis of VSEPR theory.	le on the 5
	b)	State the condition for the formation of MO and Explain molecular orbital $N_2$ molecule.	l diagram for 5
		OR	
	c)	What is $sp^3d^2$ hybridization? Explain formation of SF <sub>6</sub> molecule on the by hybridization.	asis of 2 1/2
	d)	State any five postulates of valence Bond Theory.	2 1/2
	e)	Be <sub>2</sub> diatomic molecule does not exist. Explain on the basis of MOT	2 <sup>1</sup> / <sub>2</sub>
	f)	Explain MO diagram of $B_2$ molecule	2 1/2
3.	a)	What is diagonal relationship? Explain diagonal relationship between Li a	and Mg. 5
	b)	Discuss following properties of 'P' block elementsi) Oxidation stateii) Electronegativity	5
		OR	
	c)	Explain complex formation tendency of alkali & alkaline earth metal.	2 1/2
	d)	State importance of 'S' Block elements in biosystem.	2 <sup>1</sup> / <sub>2</sub>
	e)	Explain structure and bonding in phosphorus Pentoxide.	2 1/2
	f)	Write a short note on the hydrides of group $V_A$ elements.	2 1/2

4.	a) b)	Explain the structure and Bonding in i) $X_eF_4$ ii) $X_eOF_2$ What are requirement of primary standard in volumetric analysis? How Ostwald theory explain the colour change of indicators?	5 5
		OR	
	c)	What is hydrogen bonding? State the effect of hydrogen bonding on i) Viscosity ii) Solubility.	2 1/2
	d)	Explain structure & bonding in $X_eF_2$	2 1/2
	e)	What is redox indicator? Discuss internal and external indictor.	2 1/2
	f)	Write a note on metallochromic indicator.	2 1/2
5.		Solve any ten questions.	1x10= 10
		<ul> <li>a) State Schrodinger wave equation.</li> <li>b) Give Mulliken mathematical expression to calculate electronegativity.</li> <li>c) State any two significance of spin quantum number.</li> <li>d) Define <ul> <li>i) Bond energy</li> <li>ii) Bond angle</li> </ul> </li> <li>e) State the type of hybridization and bond angle in CIF<sub>3</sub></li> </ul>	10
		f) Draw molecular orbital diagrams for Li <sub>2</sub> molecule	
		g) Write electronic configuration of i) Ca $(z = 20)$ ii) Mg $(z = 12)$	
		h) Draw structure of orthophosphoric acid.	
		<ul> <li>i) How ionic or salt like hydride are formed using alkali metal?</li> <li>j) H<sub>2</sub>O is liquid and H<sub>2</sub>S is gas at normal temperature why?</li> </ul>	
		<ul> <li>h) Exploin why Noble gases are inert.</li> </ul>	

- Explain why Noble gases are inert Draw shape of  $XeF_6$  molecule. k)
- l)

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