M.Sc. (Chemistry) (NEP Pattern) Semester-I

PSCCHT01 - Inorganic Chemistry Paper-I

P. Pages : 2 **GUG/W/24/15070(S)**

Time : Three Hours * 7 6 9 4 * Max. Marks : 80

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1. a) Explain VSEPER Theory in details. **8**

b) Explain John teller distortion. **8**

OR

c) Why bond angle decrease in following order $PI_3\left(102^o\right) > PBr_3\left(101.5^o\right) > PCl_3\left(100^o\right)$. **4**

d) Write short note on bent rule. **4**

e) Explain M.O theory for octahedral complex without π-bond. **4**

f) Give splitting of d-orbital in tetragonal complexes with suitable diagram. **4**

2. a) Explain various factors affecting stability of metal complexes. **8**

b) Explain base Hydrolysis Reaction of six coordinated Co(III) Ammine complex. **8**

OR

c) Discuss Job's method to determine the composition of a complex. **4**

d) Give the relation between stepwise and overall formation constant. **4**

e) Explain stereochemistry of intermediates in SN^1 reaction. **4**

f) How does the chelate effect enhance the thermodynamic stability of complexes. **4**

3. a) What do you know about banana bond in B_2H_6, Give M.O treatment for the structure in B_2H_6. **8**

b) What do you mean by carboranes, give it's classification & explain structure of any one carboranes. **8**

OR

c) Calculate styx number for B_5H_9. **4**

d) Write a note on 3C-2C bond. **4**

e) What do you mean by cluster, give classification of boron hydrides. **4**

	f)	Discuss with one example of metalloborane.	**4**
4.	a)	Describe clearly halide type clusters.	**8**
	b)	Explain in detail Heteropoly acids.	**8**

OR

	c)	Explain structure and bonding in $W_4(OR)_{16}$.	**4**
	d)	Write classification of metal clusters.	**4**
	e)	Write short note on metal-metal bond with suitable examples.	**4**
	f)	Explain Hexanuclear clusters of halide with one example.	**4**
5.	a)	Explain the geometry of dF_3, why distortion occurs.	**2**
	b)	Explain the term high spin complex with one example.	**2**
	c)	Write short note on Bent rule.	**2**
	d)	Define the term Inert & Labile complex.	**2**
	e)	Write one preparation of $C_2B_3h_7$.	**2**
	f)	Draw the SN^2 mechanism diagrammatically.	**2**
	g)	What is the action of sodium or potassium amalgam on B_2H_6.	**2**
	h)	Write any two preparation of Metallo Carborenes.	**2**

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