Roll No. .....

(04/17-I)

5188

B. Sc. EXAMINATION

(For Batch 2014 & Onwards)

(Second Semester)

INORGANIC CHEMISTRY

Paper IV

CH-104

Time : Three Hours *Maximum Marks : 27*

Note : Q. No. **1** is compulsory. It carries 7 marks. Attempt *Five* questions in all, selecting at least *two* questions each from Sections A and B.

1. (a) What is Hydrogen bond ? Define.

   (b) Draw and explain the structure of O_3 molecule.

   (c) Why IF_7 exits but BrF_7 does not ?

   (d) Why do the hydrides of Oxygen and sulphur differ in physical state ?

   (e) Predict the shape of CIF_3 on the basis of VSEPR theory.

   (f) NO_2 readily forms dimer whereas CIO_2 does not. Why ?

   (g) Why the colour deepens from fluorine to iodine in halogen family ?

Section A

2. Ice floats on Water. Explain.

3. Account for the following :

   (a) $Be(OH)_2$ is insoluble but $Be(OH)_2$ is fairly soluble in water.

   (b) $Be(OH)_2$ is amphoteric while $Mg(OH)_2$ is basic.

4. Describe the structure of XeF_2, XEF_4 and XeF6 by applying VSEPR theory.

Section B

5. (a) What are interhalogen compounds ? How are they formed ? Discuss the structure of IF_7 and ClF_3.

   (b) Draw the structure of :

   (i) $XeOF_2$

   (ii) H_3PO_3.

6. How would you account for the following ?

   (a) H_2S is more acidic than H_2O

   (b) The N-O bond in NO_2 is shorter than N-O bond in NO_3

   (c) Both O_2 and Fe_2 stabilize high oxidation states but the ability of oxygen to stabilize the higher oxidation states exceeds that of fluorine.

7. Explain the following giving reasons :

   (a) H_3PO_4 is diprotic.

   (b) Nitrogen is an exothermic compound but NCl_3 is an endothermic compound.

   (c) $(SiH_3)_3N$ is a weaker base than $(CH_3)_3N$ why ?