



**UNIVERSITY OF NORTH BENGAL**  
B.Sc. Honours 3rd Semester Examination, 2020

**CC5-CHEMISTRY**

**INORGANIC CHEMISTRY**

Full Marks: 40

**ASSIGNMENT**

*The figures in the margin indicate full marks.  
All symbols are of usual significance.*

**Answer any four questions from the following**

10×4 = 40

- |   |     |
|---|-----|
| 1. (a) Metal oxides are unstable at high temperature. Explain using Ellingham diagram.        | 2   |
| (b) What is hydrometallurgy? Give one example where it is used for metal extraction.          | 2+1 |
| (c) Explain why trivalent phosphorus compounds can serve both as Lewis acid and also a base?  | 2   |
| (d) What is homocatenation? Why is carbon unique in this regard?                              | 1+2 |
| 2. (a) How and why does fluorine differ from the other members of the group?                  | 3   |
| (b) Xenon forms a number of compounds whereas neon cannot. Explain.                           | 2   |
| (c) NO <sub>2</sub> readily dimerizes while NO does not. Explain.                             | 2½  |
| (d) Differentiate between ionic and covalent hydrides.  | 2½  |
| 3. (a) What are clathrate compounds? Give examples.   | 3   |
| (b) Cite evidences for I <sup>+</sup> and I <sup>3+</sup> .                                   | 2½  |
| (c) Explain why BBr <sub>3</sub> is better Lewis acid than BF <sub>3</sub> .                  | 2   |
| (d) Write a brief note on the structure of XeF <sub>6</sub> .                                 | 2½  |
| 4. (a) Briefly discuss the bonding in B <sub>2</sub> H <sub>6</sub> .                         | 4   |
| (b) Boric acid is a weak acid but its acidity increases in presence of glycerol. Explain.     | 2   |
| (c) Draw the structures of P <sub>4</sub> O <sub>6</sub> and P <sub>4</sub> O <sub>10</sub> . | 2   |
| (d) Explain why silanes are much more reactive than alkanes?                                  | 2   |

5. (a) What are interhalogen compounds? How they are classified? Explain why interhalogens are more reactive than their component halogens? 1+1+2
- (b) From HSAB principle, explain the followings: 2+2
- (i) In nature  $Mg^{2+}$  has been found as  $MgCO_3$  but not as  $MgS$ .
- (ii)  $LiI$  hydrolyses more than  $LiF$  but  $HgF_2$  hydrolyses more than  $HgI_2$ .
- (c) Hydrides of p-block elements are covalent. Why? 2
6. (a) What are phosphazenes? How are they prepared? 1+3
- (b) Compare the pseudohalogens with the halogens. 3
- (c) The acidity of oxyacids of chlorine is in the order:  $HClO_4 > HClO_3 > HClO_2 > HClO$ . Explain. 3
7. (a) Borazine is not a perfect analogue of benzene. Explain. 3
- (b) What are silicones? How are they prepared? 1+2
- (c) What are inorganic polymers and how they differ from organic polymers? 1+2
- (d) What are silicone rubber? 1
8. (a) Write a short note on inorganic graphite. 4
- (b) What are Caro's acid and Marshall's acid? 2
- (c) State the principles of refining of metal by zone refining method. 2
- (d) What do you mean by levelling effect of a solvent? 2

—x—