LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

SECOND SEMESTER – **APRIL 2025**

16/17/18UCH2MC02 – CHEMICAL BONDING AND MAIN GROUP ELEMENTS

Date: 29-04-2025 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

SECTION A

Answer ANY FOUR of the following **4 x 10 = 40**

1. Discuss the factors influencing the formation of ionic compounds.
2. Draw and explain the Born-Haber cycle.
3. List out the differences between amorphous and crystalline solids.
4. Explain the crystal structure of sodium chloride and sketch the diagram.
5. Discuss the various types of hydrogen bonding.
6. Write the anomalous behavior of Li and Be.
7. Explain the classification of boranes and carboranes with example.
8. Draw structure and oxidation state of nitrogen in the following oxides of nitrogen NO, N_2O, NO_2, N_2O_4 and N_2O_5.

SECTION B

Answer ANY THREE of the following **3 x 20 = 60**

9. a) What is lattice energy and factors affecting lattice energy? (10)
   b) Explain the properties of ionic compounds. (10)
10. a) Write a note on crystal defects of Schottky, Frenkel defects and F-center. (10)
    b) Draw and explain the crystal structure of zinc blende and wurtzite. (10)
11. a) Discuss the variation of boiling point of hydrides of VA, VIA and VIIA groups. (10)
    b) Explain the preparation, properties, structure and uses of clathrates. (10)
12. a) How to prepare and properties of Na_2CO_3 and $NaHCO_3$? (10)
    b) Write a note on complexes of crown ethers and sodium and potassium pump. (10)
13. a) Explain the preparation, properties and structure elucidation of diborane. (10)
    b) Discuss the classification of carbides with example. (10)
14. a) Explain the classification of silicates with examples. (10)
    b) Write a note on structure and oxidation state of oxoacids of phosphorus. (10)
