LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

THIRD SEMESTER – **NOVEMBER 2024**

CH 3507 – MAIN GROUP ELEMENTS & SOLID STATE CHEMISTRY

Date: 08-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

Section-A

Answer any FOUR questions. **(4 × 10 = 40)**

1. How are the alkali metals reacting with water and air? Explain.
2. Explain the following.

   i) Sodium-potassium pump ii) Crown ether-alkali metal complexes
3. Discuss the ionic, interstitial, and covalent carbides with examples.
4. Illustrate the preparation and properties of nitrogen oxides.
5. Write a note on the metallic and nonmetallic character of group-15 elements in the periodic table.
6. Why is fluorine the most reactive halogen? List out the anomalous behaviors of fluorine.
7. Why are cyanide, thiocyanate, and azide called as pseudohalogens? Justify with structure and properties.
8. Explain the Schottky and Frenkel defects with suitable examples.

Section-B

Answer any THREE questions. **(3 × 20 = 60)**

9. Illustrate the anomalous behavior of Li and Be in their respective group in the periodic table.
10. Classify and describe the properties and structures of silicates with examples.
11. Define allotropy. Outline the structural features and uses of the following carbon allotropes.

    (i) Diamond (ii) Graphite (iii) Fullerene (iv) Carbon nanotubes
12. Outline the formation and characteristics of the following oxides with examples.

    (i) Mono oxide (ii) Super oxide (iii) Acidic oxide (iv) Basic oxide (v) Amphoteric oxide
13. How is the available chlorine in bleaching powder estimated by various methods? Explain.
14. Write a note on each of the seven crystal systems and fourteen Bravais lattices.
