



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

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

**THIRD SEMESTER – NOVEMBER 2013**

**CH 3507/CH 3503/CH 4501 – MAIN GROUP ELEMENTS & SOLID STATE CHEM.**

Date : 08/11/2013  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**PART – A**

Answer ALL the questions:

**(10 x 2 = 20 marks)**

1. Mention the oxides of the alkali metals.
2. Alkali metals act as strong reducing agents. Give reason
3. Explain the borax bead test.
4. What is carborundum?
5. How is sodium bismuthate prepared? Mention its use.
6. List the oxyacids of sulphur.
7. What are pseudohalogens?
8. Give the structure of ICl.
9. If the radius ratio is 0.72, What is the coordination number and geometry of the crystal.
10. Define unit cell.

**PART - B**

Answer any EIGHT questions:

**(8x5 =40 marks)**

11. Explain the biological importance of Na and K.
12. Give the methods of preparation, properties and uses of hydrazine.
13. Explain the structure of diborane.
14. Discuss the classification of carbides. Give suitable examples.
15. Explain limiting radius ratio. How is it used to determine the geometry of the crystal?
16. Discuss the principle of X-ray diffraction.
17. Explain the following giving appropriate reason.
  - a) Alkali metals do not occur free in nature.
  - b) Alkaline earth metals have a great tendency to form complexes than alkali metals.
  - c) Borazine is called inorganic benzene
18. How are the following prepared?
  - (a) Chlorine dioxide
  - (b) Oxygen difluoride
  - (c) Borax.
19. What is superphosphate of lime? Give its preparation.
20. Describe the preparation, properties and structure of Caro's acid.
21. a)  $\text{H}_3\text{PO}_2$  and  $\text{H}_3\text{PO}_3$  act as reducing agents. Explain.
  - b) Explain the amphoteric nature of aluminium with suitable examples.
22. How is available chlorine in bleaching powder estimated?

**PART -C**

Answer any FOUR questions:

**(4x10=40 marks)**

23. What are silicates? Discuss the classification with an example each.
24. How is beryllium extracted from beryl?
25. Name the important defects in crystals. Discuss the stoichiometric defects in crystals.
26. How are oxides classified? Explain giving an example each.
27. Discuss the structures of cesium chloride and zinc blende.
28. What are interhalogen compounds? Discuss the preparation, properties and structure of  $\text{IF}_5$  and  $\text{BrF}_3$  .

**\$\$\$\$\$\$**