LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **APRIL 2013**

CH 3503/CH 4501 - MAIN GROUP ELEMENTS & SOLID STATE CHEMISTRY

Date: 02/05/2013 Dept. No. Max. : 100 Marks
Time: 9:00 - 12:00

PART –A

Answer ALL the questions: **(10×2=20 marks)**

1. Why are alkali metals generally kept in kerosene?
2. Write the name, formula and the preparation of an organometallic compound of lithium.
3. Why is boron called as 'semi-metal'?
4. Mention the allotropes of carbon.
5. What is inert pair effect?
6. Write the names and compositions of any two phosphate fertilizers.
7. How is BrF_3 prepared?
8. How is bleaching powder prepared?
9. How are Weiss and Miller indices related to each other?
10. Write Bragg's equation and explain the terms.

PART-B

Answer any EIGHT questions: **(8×5=40 marks)**

11. What are crown ethers? Give any two crown ether complexes of s-block metals and their preparation.
12. Describe the anomalous behaviour of lithium and beryllium.
13. Discuss the structure of diborane.
14. What are carbides? How are they classified? Give an example for each class.
15. Write a comparative account of the hydrides of nitrogen group elements.
16. How is hydrazine prepared? Mention any four reactions of hydrazine.
17. How is dithionic acid prepared? Describe its structure and comment on its bond angles.
18. Give the preparation structure and any two reactions of Cl_2O_7.
19. Describe the preparation, properties and structure of $HClO_4$.
20. What are psuedohalogens? Give the preparation and structure of any one of them.
21. Write an account of point defects in solids.
22. Explain the principle of powder X-ray diffraction technique.

PART-C

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

23. Discuss the extraction of beryllium from its principal ore.
24. Describe the classification of silicates with an example for each class.
25. Write a brief account of the preparation, properties and uses of any two oxoacids of nitrogen.
26. Describe the structures of peroxides, suboxides, amphoteric and neutral oxides.
27. Deduce the structures or shapes of the following using VSEPR theory.

    (i) ClF_3 (ii) IF_5 and (iii) ICl.
28. Discuss the structures of the following:

    (i) NaCl (ii) TiO_2 (iii) CsCl.

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