LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – APRIL 2017

CH 3507 / CH 3503- MAIN GROUP ELEMENTS & SOLID STATE CHEMISTRY

Date: 03-05-2017 Dept. No. Max. : 100 Marks
Time: 09:00-12:00

PART A

ANSWER ALL QUESTIONS 10x 2 = 20 Marks

1. What is the action of i) Lithium with Nitrogen ii) Magnesium with Nitrogen.
2. Predict the oxide formed when molecular oxygen reacts with i) Sodium ii) Potassium.
3. How many 3 centered- 2 electron and 2 centered- 2 electron bonds are present in diborane.
4. Distinguish Quartz from Glass.
5. Draw the structure of ClF_3 and IF_7
6. Which is called laughing gas? Mention the important application of that compound
7. Write the molecular formula of Nitrous oxide, Nitrogen pentoxide, Nitrogen dioxide and dinitrogen tetroxide.
8. What are pseudo halogens? Give any two examples.
9. What is a Unit cell?
10. Write the Mathematical expression of Bragg's law and explain the terms in it?

PART B

ANSWER ANY EIGHT QUESTIONS 8 x 5 = 40 Marks

11. Write a note on Stoichiometric defects in solids
12. Discuss the different types of closed packing of ions.
13. Sketch and explain the structure of Rutile.
14. Outline the method of preparation of Sodium Hydroxide and also mention the importance of it.
15. Show that Lithium and Magnesium possess similar properties .
16. Mention any two methods of preparation of Diborane. What is the action of diborane with
    i) H_2 ii) O_2 iii) HCl
17. Write a note on carbides and how are they classified?
18. a) What is boron sesquioide and how is it prepared.
    b) Draw the structure of Boric acid and show that it behaves like a Lewis acid
19. Explain in brief the properties of Group 15 Hydrides.
20. Write the chemical formula of the following. i) Orthophosphoric acid ii) Nitrous acid iii) pyrophosphoric acid iv) pyrophosphoric acid v) hypophosphoric acid.
21. Explain the oxoacids of Sulphur with suitable examples.
22. Write a note on the oxidation states of halogens in various oxoacids.

PART C

ANSWER ANY FOUR QUESTIONS 4 x 10 = 40 Marks

23. a) Explain the metabolic function of Sodium-Potassium Pump and its importance. **(6)**

b) Explain the characteristics of group-I metals when it reacts with water **(4)**

24. a) Write a note on the classification of silicates based on their structural framework of Si-O linkage **(6)**

b) Write short notes on ceramics and its composition. **(4)**

25. a) Write a note on the chemical properties of the elements belonging to Nitrogen family **(5)**

b) Starting from Ammonia how will you prepare i) Hydrazine ii) Hydrazoic acid **(5)**

26. a) Write a note on the importance of Sulphuric acid **(6)**

b) How are Caro's acid and Marshall's acid prepared **(4)**

27. What are interhalogen compounds? Explain in detail about the oxidation states of halides in any three interhaolgen compounds and their structures based on VSEPR theory.

28. a) Sketch and explain the structure of codium chloride **(6)**

b) Explain i) Weiss indices ii) Miller indices **(4)**

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