



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – CHEMISTRY

SECOND SEMESTER – NOVEMBER 2016

CH 2815 - CHEMISTRY OF MAIN GROUP ELEMENTS

Date: 08-11-2016
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 × 2= 20)

1. Give an example for (i) electron deficient (ii) electron rich compounds.
2. What are allotropes? List the allotropes of carbon and their properties.
3. What is phosphine? How does it react with oxygen?
4. What are halogen oxides? Give the preparation of any one halogen oxide.
5. Draw the structure of any two oxides of chlorine.
6. What are ionophores? Give an example.
7. Mention the synthetic importance of PCl_5 .
8. Give the name and structure of anyone macrocyclic ligand with oxygen as coordination site.
9. What is Grignard reagent? Mention any one application.
10. What is hydrosilylation reaction? Give the mechanism.

Part-B

Answer any EIGHT questions.

(8 × 5= 40)

11. Briefly explain the structure of fullerene C_{60} .
12. What are (i) calixaranes and (ii) cryptands?
13. Citing examples, explain element–element multiple bonding.
14. Account for the fact that SiCl_4 reacts with water where CCl_4 does not.
15. Explain the preparation and structures of any two sulphur fluorides.
16. How is periodic acid prepared? What is its application?
17. Derive the possible styx number of B_4H_{10} .
18. Highlight the different types of bonding in the structure of B_2H_6 and give evidences.
19. Write a brief note on the types of silicones and the application of each type.
20. Discuss the structure of graphite and diamond to explain the variation of conducting behavior.
21. Discuss the structure of zeolite and its role in the purification of water.
22. Write a brief note on the types of halogenating agent.

Part-C

Answer any FOUR questions.

(4 × 10= 40)

23. Discuss the biological role of Na^+ and K^+ ions.
24. Explain the synthesis and uses of organo metallic compound of Li.
25. Write an essay on halogen compounds of nitrogen.
26. Predict the structure of (i) XeO_3 (ii) XeOF_2 using VSEPR theory
27. Explain why borazine is considered as inorganic benzene.
28. Discuss the preparation, properties and structure of $\text{C}_2\text{B}_{10}\text{H}_{12}$ using PSEPT theory.
