

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIRST SEMESTER – NOVEMBER 2007

CH 1500 - INORGANIC CHEMISTRY - I

AD 1

Date : 01/11/2007

Dept. No.

Max. : 100 Marks

Time : 1:00 - 4:00

PART – A

Answer ALL the questions.

(10 x 2 = 20 marks)

1. Define lattice energy.
2. What is ionic bond?
3. Helium molecule does not exist. Why?
4. Predict the geometry of SF₆ molecule on the basis of VSEPR theory
5. What are van der waals forces?
6. What are the types of hydrogen bond?
7. Define an acid based on Bonsted-Lowry theory.
8. How does an aprotic solvent differ from a protic solvent?
9. What are Caro's and Marshall's acid?
10. What is an allotropy? Give an example.

PART – B

Answer any 8 questions.

(5 x 8 = 40 marks)

11. Discuss Fajan's rule.
12. Define electronegativity. Compare Pauling and Allred-Rochow electronegativity scale.
13. What are the postulates of VSEPR theory?
14. Discuss the structure of BeF₂ and PCl₅ based on hybridization concept.
15. Draw the M.O. diagram of O₂ molecule. Explain its bond order.
16. What are clathrates? Give examples.
17. What are the consequences of hydrogen bond?
18. Explain HSAB theory.
19. Discuss the Lewis theory of acids and bases.
20. Describe the preparation and structure of PCl₅.
21. Write a note on different oxides of nitrogen.
22. Write the preparation and properties of hydrazine.

PART – C

Answer any TWO questions.

(2 x 20 = 40 marks)

23. (a) How is lattice energy of NaCl determined using Born – Haber cycle (5)
(b) What are the conditions for the formation of ionic bond? (3)
(c) What is hybridization of orbitals? (2)
24. (a) Compare UB and M.O theory. (4)
(b) Predict the bond order of nitrogen molecule using M.O. theory (6)
25. Explain (a) inter molecular hydrogen bond. (5)
(b) band theory of metals. (5)
26. (a) Describe the levelling effect of solvent (5)
(b) How is liquid ammonia used as solvent? (5)
27. Discuss (a) oxidation states and metallic character of nitrogen group elements. (6)
(b) nitrogen fixation (4)
28. (a) How are hydrides of oxygen group elements prepared? (5)
(b) Explain the structure and uses of oxyacids. (5)

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