LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIRST SEMESTER – November 2009

CH 1500 - INORGANIC CHEMISTRY - I

Date & Time: 10/11/2009 / 1:00 - 4:00 Dept. No. Max. : 100 Marks

PART – A

Answer **ALL** the questions**.** (10 x 2 = 20 marks)

1. How does ionization energy vary across a period and down a group?
2. Define Lattice energy.
3. Draw the structure of SF_6.
4. Mention any two properties of a covalent compound.
5. What are van der Waals forces?
6. Define Bronsted –Lowry theory of acid and base,
7. What are aprotic solvents?
8. Hydrogen fluoride exists as a dimer. Give reason.
9. Name the oxy acids of phosphorous.
10. What are the hydrides of nitrogen?

PART – B

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

11. What are Fajans rule?
12. How is lattice energy of KCl determined using Born-Haber's cycle?
13. Compare and contrast valence bond and molecular orbital theories of bonding.
14. Discuss the structure of BeF_2 and PCl_5.
15. What are the postulates of VSEPR theory?
16. Explain the types of hydrogen bonding with suitable examples.
17. What are clathrates? Give examples.
18. How is liquid ammonia used as a solvent?
19. Explain the lewis definition of acids and bases.
20. Discuss the preparation, properties and structure of hydrazine.
21. Comment on the preparation and properties of hydrides and halides of sulphur.
22. Describe the oxidation state, reactivity and metallic character of the elements of nitrogen group.

PART – C

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

23. a) Discuss the factors favouring the formation of ionic compound.

b) Explain the various electronegativity scales. (4+6)

24) Draw MO energy level diagram for NO. Predict the bond order and magnetic Properties.

25) Explain a) band theory of metals b) dipole-dipole interactions

26. a) Explain the leveling effect of solvents with suitable examples.

b) What is HSAB principle? Mention its application. (5+5)

27. Discuss the preparation, properties and structure of the hydrides, halides, oxyacids and oxides of phosphorous.

28. a) How is peroxodisulphuric acid prepared? Discuss its properties and structure.

b) Classify the oxides of sulphur and complete the following reactions with balanced equations.

1. $HNO_3 + SO_2 \rightarrow$
2. $SO_2 + PbO_2 \rightarrow$
3. $SO_3 + C \rightarrow$

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