



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIRST SEMESTER – NOVEMBER 2011

CH 1503 - CONCEPTS IN INORGANIC CHEMISTRY

Date : 10-11-2011

Dept. No.

Max. : 100 Marks

Time : 1:00 - 4:00

PART – A

Answer ALL questions:

(10 x 2 = 20 marks)

1. State Heisenberg uncertainty principle.
2. What is EAN principle?
3. Draw the structure of NH_3 & H_2O .
4. Water at 298 K is a liquid where as hydrogen sulphide is a gas – why?
5. What are aprotic solvents? Give one example.
6. What is double decomposition reaction?
7. Draw the ccp and hcp arrangement of crystal lattice.
8. Electronegativity is the order $\text{F}_2 > \text{Cl}_2 > \text{Br} > \text{I}_2$. – substantiate.
9. State Hund's rule of maximum multiplicity.
10. Write the electronic configuration of Sodium and Calcium.

PART – B

Answer any EIGHT questions:

(8 x 5 = 40 marks)

11. Derive Schrodinger equation.
12. What is periodicity? Explain diagonal relationship with an example.
13. Write about: (i) electrochemical series (ii) Paulings scale of electronegativity.
14. State and explain Fajan's rules.
15. Explain the following: (i) ionization potential (ii) electron affinity.
16. a) State Lewis theory b) Write about octet rule and its exception.
17. Compare VBT and MO theories.
18. a) What is isoelectronic principle? b) Draw the electron dot structure of HCl and MgO_2 .
19. Write a short notes on: (i) Crystalline hydrates (ii) Clathrates.
20. State and explain Arrhenius theory.
21. Explain the band theory of metals.
22. Explain the following: (i) Symbiosis (ii) Usanovich concept of acids & bases.

PART – C

Answer any FOUR questions:

(4 x 10 = 40 marks)

23. What is an Ellingham diagram? With the help of this diagram explain the thermodynamics of reduction processes.
24. How will you calculate lattice energy of sodium chloride using Born Haber cycle?
25. Construct the molecular orbital diagram for N_2 and CO and calculate the bond order.
26. Methane, ammonia and water are sp^3 hybridised. But bond angles are 109, 107 & 104 respectively – explain.
27. a) Explain Hume - Rothery rule with example.
b) Mention any two reactions in sulphuric acid medium.
28. a) How is liquid ammonia used as a solvent in various reactions?
b) Bring out the striking features of alkali and alkaline earth metals in liquid ammonia.

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