LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – **NOVEMBER 2019**

UCH 1501 – BASIC CONCEPTS IN INORGANIC CHEMISTRY

Date: 30-10-2019 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

Part-A

Answer ALL questions **(10x2=20)**

1. Write the electronic configuration of (i) Cr and (ii) Cu

2. Define the term inert-pair effect.

3. Find the oxidation number of 'Mn' in $KMnO_4$.

4. What is double decomposition reaction? Give an example.

5. Predict the shape of the following molecules: (i) NH_3 (ii) XeF_4

6. State the octet rule.

7. What is an extrinsic semi conductor? Give an example.

8. Why does metallic conduction decrease with increase in temperature?

9. What are inter halogen compounds? Give an example.

10. Why does fluorine have lower electron affinity than chlorine?

Part-B

Answer any EIGHT questions **(8x5=40)**

11. What is diagonal relationship? Explain with an example.

12. State and explain the following:

    a) Hund's rule b) Aufbau principle

13. What is electro negativity? Explain the Pauling scale of electro negativity.

14. Explain the Hard-Soft Acid-Base concept with an example.

15. Explain the role of liquid NH_3 as a solvent.

16. What are direct and indirect redox reactions? Explain them with suitable examples.

17. Using the VSEPR theory, explain the geometry of the following compounds: (i) SF_6 (ii) CH_4

18. Compare and contrast VBT and MOT.

19. What are super conductors? Explain their conductivity nature with suitable examples.

20. Explain the basic nature of iodine.

21. Explain the preparation, properties and the structure of IF_5.

22. How will you estimate the amount of available chlorine in bleaching powder?

Part-C

Answer any FOUR questions **(4x10=40)**

23. a) Define ionization energy. Explain its variation along a period and in a group in the periodic table.

b) State and explain the following: **(6+4)**

(i) Heisenberg's uncertainty principle (ii) Pauli's exclusion principle

24. a) How are chemical reactions balanced using oxidation number method? Give an example.

b) Explain the Allred-Rochow scale of electro negativity. **(5+5)**

25. Explain the following theories of acid-base concept with suitable examples:

(a) Lux-Flood (b) Usanovich **(5+5)**

26. a) Write a short note on Slater's rules.

b) CH_4 and NH_3 are sp^3 hybridized, yet their bond angles are 109^o and 107^o respectively. Explain. **(5+5)**

27. Construct the MO diagram of oxygen molecule and predict the bond order, stability and magnetic properties of oxygen molecule.

28. a) Explain the preparation, properties and structure of I_2O_5.

b) What are pseudo halogens? Explain it with suitable examples. **(5+5)**

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