

B.Sc. (CBCS Pattern) Semester-I
USCHT01 - Chemistry Paper-I - Inorganic Chemistry

P. Pages : 2

Time : Three Hours



GUG/W/24/11544

Max. Marks : 50

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1. a) What is quantum numbers? Name for quantum number and explain any two of them. Find values of n , l and m for $3S$. 5
- b) Define Ionization Energy. Explain factors affecting on it and variation of Ionization potential in period and group. 5

OR

- c) Write a note on Pauli's exclusion principle. 2½
- d) Explain Mulliken's scales of electronegativity. 2½
- e) Define effective nuclear charge. Calculate effective nuclear charge for $3P$ electron of Silicon using Slater's rule. 2½
- f) Explain Hund's rule of multiplicity. 2½
2. a) What is hybridization? Explain SP^3 and SP^3d hybridization with example. 5
- b) Explain Coulson's MO Diagram of co-molecule. 5

OR

- c) Give the postulates of valence bond theory. 2½
- d) Explain the shapes of NH_3 molecule on the basis of VSEPR theory. 2½
- e) Draw molecular orbital diagram of O_2 . Calculate bond order of O_2 molecule using MO theory. 2½
- f) On the basis of MOT Explain why He_2 molecule does not exist? 2½
3. a) What do you mean by Diagonal relationship? Explain Diagonal relationship between Li and Mg. 5
- b) What are P block elements Discuss S block elements with respect to 5
- i) Oxidation state.
- ii) Reducing property.

OR

- c) Explain structure of P_2O_3 . 2½
- d) Explain the role of S-block elements in Biosystem. 2½
- e) Explain Complex formation tendency of alkali and alkaline earth metal. 2½
- f) Explain the structures of ortho phosphoric acid (H_3PO_4) and phosphorous pentoxide (P_2O_5). 2½
- 4.** a) Write short note on Redox Titration, Explain theory of external & internal redox indicator. 5
- b) Explain the structure and bonding of 5
- i) $XeOF_2$ ii) XeF_6

OR

- c) Explain property of Nobel gases. 2½
- d) What is redox indicator? Discuss internal and external indicator. 2½
- e) Explain effect of Hydrogen bonding on viscosity and boiling point. 2½
- f) Write note on Oswald's theory of indicator. 2½
- 5.** Attempt **any ten**. 10
- i) State Heisenberg's uncertainty principle.
- ii) Define Shielding effect.
- iii) Write electronic configuration of Cu and Cr.
- iv) Define Bond Energy and bond length.
- v) Why Helium molecule does not exist.
- vi) Draw M.O. Diagram He_2 molecule.
- vii) Draw structure of Orthophosphoric acid.
- viii) What is Solvation?
- ix) Write electronic configuration of Ca and Ba.
- x) Draw the structure XeF_4 .
- xi) Define Complexometric titration.
- xii) Define self indicator. Give one example of it.
