

B.Sc. First Year (CBCS Pattern) Sem-I
USCHT01 - Chemistry Paper-I : Inorganic Chemistry

P. Pages : 2

Time : Three Hours



GUG/W/23/11544 (S)

Max. Marks : 50

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1. a) What is quantum numbers? Name four quantum number and explain any two of them. **5**
- b) Define Ionization Energy. Explain factors affecting on I.P. and variation of Ionization potential in period and group. **5**

OR

- c) Write a note on Pauli's exclusion principle. **2½**
- d) Derive an expression for deBroglie Wavelength. **2½**
- e) Define effective nuclear charge. Calculate effective nuclear charge for 3P electron of Silicon. **2½**
- f) Explain Pauling scale of electronegativity. **2½**
2. a) What is hybridization and explain sp^3d^2 and sp^3d^3 hybridization with example. **5**
- b) Discuss various rules of VSEPR theory and explain shape of ClF_3 molecule on the basis of VSEPR theory. **5**

OR

- c) Distinguished between Bonding Molecular orbital and Antibonding Molecular orbital. **2½**
- d) Give postulates of valence bond theory. **2½**
- e) Draw molecular orbital diagram of O_2 . Calculate the bond order and explain magnetic nature. **2½**
- f) Explain sp^3 hybridization with example. **2½**
3. a) What do you mean by Diagonal relationship? Explain Diagonal relationship between Li and Mg. **5**
- b) What are S 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 electron affinity of P block elements. 2½
4. a) What is hydrogen bond? Discuss types of it and explain effect of hydrogen bond on Melting point and boiling point. 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) Write a note on metallochromic indicator. 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 of B_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.
