

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

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| 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

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| c) | Explain property of Nobel gases. | 2½ |
| d) | What is redox indicator? Discuss internal and external indicator. | 2½ |
| e) | Write a note on metalochromic 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. | |
