

Bachelor of Science (B.Sc. - I) First Semester (Old)
CHE101 - Chemistry: Paper-I (Inorganic Chemistry)

P. Pages : 2

Time : Three Hours



GUG/W/18/1202

Max. Marks : 50

1. a) Explain the following: 5
i) Heisenberg uncertainty principle ii) Hund's rule of multiplicity
- b) Define ionization energy. Explain variation of ionization energy in a period as well as group. 5

OR

- c) State and explain Pauli's exclusion principle. 2½
- d) What are quantum numbers? Give the significance of principle quantum number. 2½
- e) Discuss Slater's rule. 2½
- f) Discuss Pauling scale of electronegativity. 2½
2. a) Explain valence bond theory and give its limitation. 5
- b) Discuss Coulson's molecular orbital diagram of CO molecule. 5

OR

- c) What is hybridization? Discuss the Formation of PCl_5 molecule on the basis of hybridization. 2½
- d) Explain VSEPR theory of formation of ICl_4^- ion. 2½
- e) Discuss molecular orbital diagram of H_2 molecule and calculate its bond order. 2½
- f) Explain LCAO approximation. 2½
3. a) Discuss following properties of 'S' block elements with respect to: 5
i) Ionization energy ii) Electron affinity
- b) Explain structure of following: 5
i) P_2O_3 ii) Phosphoric acid

OR

- c) Discuss diagonal relationship between Li & Mg 2½
- d) Explain reducing property of 'S' block element. 2½

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| e) | Explain electronegativity of 'P' block element. | 2½ |
| f) | Discuss the structure and bonding in pyrophosphoric acid ($\text{H}_4\text{P}_2\text{O}_7$). | 2½ |
| 4. | a) Discuss structure and bonding in borazine. | 5 |
| | b) Explain structure of XeF_4 and XeOF_4 on the basis of hybridisation. | 5 |

OR

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| c) | What are carbides? Give its classification. | 2½ |
| d) | Give any five industrial applications of Carbides. | 2½ |
| e) | Explain basic properties of iodine. | 2½ |
| f) | State important properties of noble gases. | 2½ |
| 5. | Attempt any ten . | 10 |
- i) State Aufbau principle.
 - ii) Write significance of ψ^2 .
 - iii) What is meant by electronegativity?
 - iv) Define bond energy.
 - v) State type of hybridisation involved in NH_3 and SF_4 .
 - vi) Draw M. O. Diagram of B_2 molecule.
 - vii) What are 'S' block elements?
 - viii) Define solvation.
 - ix) What are metallic hydrides.
 - x) What are interhalogen compounds?
 - xi) Write the structure of I_7^- ion.
 - xii) What are noble gases?
