

B.Sc. (NEP) Semester-I  
**BSCCH501 - (Core) Chemistry : Basic Inorganic Chemistry**

P. Pages : 2

Time : Two Hours



**GUG/S/25/15925**

Max. Marks : 40

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1. a) What are quantum numbers? Discuss the significance of principal and azimuthal quantum numbers? 5
- b) What is Ionization Potential? Explain its trend along Period & group. 5

**OR**

- c) Derive de-Broglie relation to prove dual nature of electron. 2½
- d) Explain Hund's rule of maximum multiplicity with example. 2½
- e) Discuss Mulliken's scale of electronegativity. 2½
- f) Calculate effective nuclear charge acting on 35 of Ca( $Z = 20$ ). 2½
2. a) Define Hybridization? Explain step involve in hybridization. Explain formation of  $\text{PCl}_5$  molecule on the basis of hybridization. 5
- b) Draw and explain Coulson's M.O. diagram of carbon monoxide and calculate its bond order. 5

**OR**

- c) Write the postulates of V.B.T. 2½
- d) Using VSEPR theory, explain the shape of  $\text{NH}_3$ . 2½
- e) State the rule of LCAO approximation and Draw potential energy diagram for Bonding Mo and Antibonding MO. 2½
- f) Draw the MO diagram of  $\text{O}_2$  molecule and explain why it is paramagnetic. 2½
3. a) Discuss S-block element with respect to 5
- i) Ionization Potential
- ii) Reducing Property
- b) Discuss P – block element with respect to 5
- i) Atomic & Ionic Radii
- ii) Oxidation state.

**OR**

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|----|--|----|
| c) | Discuss function of S-block element in bio-system. | 2½ |
| d) | Explain diagonal relationship between Li and Mg.   | 2½ |
| e) | Write a note on structure & bonding of $P_2O_3$ .  | 2½ |
| f) | Explain structure of Orthophosphoric acid.         | 2½ |

**4. Short Questions any ten.**

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|-------|--|-------------|
| i)    | Write down Schrodinger wave of eq <sup>n</sup> .             | 1           |
| ii)   | Write the electronic configuration of                        | 1           |
| a)    | $Na^+$   | b) $O^{2-}$ |
| iii)  | What is Covalent radius?                                     | 1           |
| iv)   | Define Electronegativity.                                    | 1           |
| v)    | Define Bond Energy.  | 1           |
| vi)   | Mention the type of hybridization and bond angle of $H_2O$ . | 1           |
| vii)  | $He_2$ molecule does not exist. Why                          | 1           |
| viii) | Draw the Mo Diagram of $Li_2$ molecule.                      | 1           |
| ix)   | Define term solvation.                                       | 1           |
| x)    | Write the reaction of NaH with $H_2O$ .                      | 1           |
| xi)   | Draw the structure of Pyrophosphoric acid.                   | 1           |
| xii)  | What are P-block elements.                                   | 1           |

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