



SECTION-A

Long Answer Questions

(Attempt any four questions and each question carries 8 Marks)

1. State and explain Heisenberg's uncertainty Principle.
2. Give M.O. Treatment for the formation of N_2 molecule
3. Describe optical isomerism in case of Tartaric acid.
4. Explain acidic nature of terminal alkynes with examples.
5.
 - a) Describe conditions necessary for the formation of ionic bond.
 - b) Give significance of radial and angular plots of atomic orbitals
6.
 - a) Give the mechanism involved in the hydroboration reaction with examples.
 - b) Describe precisely the methods that are used to arrive at mechanism of a reaction.

Problem Based Question

(Attempt any four questions and each question carries 4 Marks)

7. Determine uncertainty of finding electron in a nucleus.
8. How VSEPR- Theory can be used to determine structure SF_4 molecule.
9. Draw structures of optical isomers of 2-chloro-3-iodopropane.
10. Write notes on;
 - a) 1,4-addition of dienes
 - b) Carbenes
11. Write notes on;
 - a) Pauling's Scale of electronegativity
 - b) Determine bond orders of CO , NO , O_2 , and N_2 molecule
12. Write notes on;
 - a) Benzynes as reaction intermediates
 - b) Hydroxylation of alkenes.

Maximum Marks = 28

Time Allotted = 35 min

(each question carries 1 Mark)

13.
 - i. In the absence of Paul's Exclusion Principle the electronic of Oxygen atom would be,
 - a) $1s^2 2s^2 2p^4$
 - b) $1s^8$
 - c) $1s^2 2s^1 2p^5$
 - d) $1s^2 2s^0 2p^6$

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- II. The increasing order of electronegativity in the following elements:
- C, N, Si, P
 - N, Si, C, P
 - Si, P, C, N
 - P, Si, N, C
- III. Which of the following compounds of elements in group 14 is expected to be most ionic?
- $PbCl_2$
 - $PbCl_4$
 - CCl_4
 - $SiCl_4$
- IV. Which of the following has a geometry different from the other three species.
- BF_4^{1-}
 - SO_4^{2-}
 - XeF_4
 - PH_4^+
- V. Which of the following is non-polar?
- CH_3Cl
 - $CHCl_3$
 - trans-2-butene
 - cis-2-butene.
- VI. In which case the all carbon atoms are identical?
- 2- Butene
 - Benzene
 - 1-Butene
 - 1-Propyne
- VII. A pair of optically active compounds which are not the mirror images are called?
- Mesomers
 - Tautomers
 - Enantiomers
 - Diastereoisomers
- VIII. What is the product when but-1-yne reacts with excess of hydrogen bromide?
- 2-bromo butene
 - 2, 2 dibromo butane
 - 1, 2-dibromo butene
 - 1, 1, 2, 2-tetra bromo butane