# P-928

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# MCH-501

**Inorganic Chemistry-I**

M.Sc. Chemistry (MSCCH)

1st Semester Examination, 2023 (June)

**Time : 2 Hours]** **[Max. Marks : 35**

**Note :** This paper is of Thirty Five (35) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

## SECTION–A
## (Long Answer Type Questions)

**Note :** Section 'A' contains Five (05) long answer type questions of Nine and Half (9½) marks each. Learners are required to answer any Two (02) questions only. (2×9½=19)

**1.** Discuss element of symmetry in detail.

**2.** Describe crystal field theory with suitable examples and also discuss its limitations.

**3.** Give the postulates of Molecular orbital theory and draw the MO diagram and $N_2$ and $N_2^+$ and $N_2^-$.

**4.** Draw and explain the Orgel diagram of $d^2$ ion in both octahedral and tetrahedral field.

**5.** Discuss the character table of water and ammonia molecules

## SECTION–B

## (Short Answer Type Questions)

**Note :** Section 'B' contains Eight (08) short answer type questions of Four (04) marks each. Learners are required to answer any Four (04) questions only. (4×4=16)

**1.** Draw the molecular orbital diagram of N2 molecule

**2.** Draw the orgel diagram d'ion in octahedral field.

**3.** Discuss alternating axis of symmetry with suitable example.

**4.** Mention the point group of $H_2O$, $NH_3$ and $CO_2$.

**5.** What do you mean by optical activity ? Explain.

**6.** Discuss abelian rules of groups.

**7.** Write a short note on ligand field parameters.

**8.** Discuss chirality and optical activity by suitable examples.

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