



UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)  
उत्तराखंड मुक्त विश्वविद्यालय, हल्द्वानी(नैनीताल)

M.Sc. CHEMISTRY (MSCCH-12)

ASSIGNMENT- FIRST YEAR

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*Last Date of Submission:* 15 May जमा करने की अन्तिम तिथि: 15 मई

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**Course Title:** Inorganic Chemistry

**Course code:** CHE501

**Year:** 2012-13

**Maximum Marks :** 40

**Section 'A'**

**Section 'A' contains 08 short answer type questions of 5 marks each. Learners are required to answers 4 questions only. Answers of short answer-type questions must be restricted to 250 words approximately.**

Briefly discuss the following:

1. How do you define a symmetry operation and symmetry elements? Discuss in brief plane of symmetry and its types.
2. Explain what is meant by molecular polarity? Are molecules of type AB<sub>4</sub> are polar or non Polar?
3. What are the salient features of crystal field theory? Also define crystal field stabilization energy.
4. Give and discuss the molecular orbital diagrams of tetrahedral and square planar complexes.
5. How does Crystal Field Theory help in classifying the inert and labile complexes? Explain with reference to at least two systems.
6. Discuss the concept of trans effect in terms of polarization theory.
7. What is Pearson's concept of hard and soft acids and bases? How are they classified? Give applications of HSAB rule.
8. Take one biomolecule that transports electrons. Comment on its structural feature and explain how it is able to participate in electron transfer?

**Section 'B'**

**Section 'B' contains 04 long answer-type questions of 10 marks each. Learners are required to answers 02 questions only.**

1. Explain the relationship between the structure, symmetry and polarity of molecules with appropriate example.
2. Discuss the molecular orbital theory as applied to metal complexes.
3. Discuss the types of insertion reactions. Explain the nature of CO insertion reaction with mechanistic details.
4. Write down the principles underlying the biological selection of elements. Write also the Biochemistry, transport and storage proteins of iron.