

10/2/2025

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U – 6601

Reg. No. : .....

Name : .....

**First Semester M.Sc. Degree Examination, February 2025**  
**Chemistry/Analytical Chemistry/Polymer Chemistry/Chemistry with**  
**Specialisation in Drug Design and Development**

**CH 211/ CL 211 / PC 211/ CHDD 511 : INORGANIC CHEMISTRY I**

**(2020 Admission Onwards)**

Time : 3 Hours

Max. Marks : 75

**SECTION – A**

Answer **two** among (a), (b) and (c) from each. Each sub question carries **2** marks.

- Give any one evidence for Jahn-teller effect
  - Discuss the crystal field theory of square planar complex
  - Calculate CFSE for  $d^5$  ion in high spin octahedral ligand field.
- Write a note on student t test.
  - What is the meant by the term 'confidence limit'?
  - TG and DTA are complimentary techniques. Justify the statement.
- What are inorganic phosphors
  - Write a brief note on inorganic liquid crystals
  - What is Keggin anions.

P.T.O.



4. (a) Give examples for polyoxometalates  
(b) Give the structure of XeF<sub>2</sub>.  
(c) Give structure of perxenate ion
5. (a) What is the role of catalytic converter?  
(b) Give examples four major automobile pollutants  
(c) Explain the composition of earth atmosphere

(10 × 2 = 20 Marks)

### SECTION – B

Answer either (a) or (b) from each question. Each sub question carries 5 marks.

6. (a) Define CFSE. Explain the factors affecting it.  
(b) Arrange the splitting of d-orbitals, in the decreasing order of square planar and tetrahedral fields
7. (a) Discuss the theory of redox indicators with example.  
(b) Discuss the theory and instrumentation of Differential scanning calorimetry (DSC).
8. (a) Write a note on mixed ionic-electronic conductors  
(b) Write a note on solid electrolytes and give their peculiarity.
9. (a) Write a note on molecular sieves and explain its applications.  
(b) What are the applications of zeolites.
10. (a) Explain the chemistry of stratosphere  
(b) Draw pE and pH predominance diagram for Fe.

(5 × 5 = 25 Marks)



### SECTION – C

Answer any **three** questions. Each question carries **10** marks

11. Construct the MO diagram of Cobalt(III) low-spin octahedral complex with sigma bonding only and discuss the salient features.
12. Explain the principle of titrations in non-aqueous media. Discuss about different solvents and indicators used in non-aqueous titrations.
13. Give a brief explanation about the solid state chemistry of metal nitrides and fluorides.
14. Explain the preparation, properties and structure of isopoly acids of Mo and V.
15. What are the chemical processes occur in lithosphere.

**(3 × 10 = 30 Marks)**

