

QP CODE: 26019320



Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, MARCH 2026

Fourth Semester

M Sc CHEMISTRY

ELECTIVE - CH800401 - ADVANCED INORGANIC CHEMISTRY

2019 Admission Onwards

FF396424

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. How do the d orbitals transform in ML_6 complexes?
2. Terminal and bridging nitrosyls in complexes can be distinguished using IR spectroscopy. Justify
3. Briefly explain the photolysis of water.
4. Explain the synthesis of any one of the non-oxide inorganic nanomaterials.
5. What are the various sources for gas phase clusters?
6. Elastic modulus of ceramics varies with that of metals. Justify.
7. What is meant by combinatorial synthesis ?
8. Discuss about Lewis acid frameworks.
9. Write a short note on dative post-synthetic modification of MOFs.
10. Explain briefly about Molecular Borromean link in supramolecular chemistry.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. How do the d orbitals split under the influence of different crystal field - tetrahedral, octahedral and square planar? Depict each case with a diagram.
12. Discuss the method of descending symmetry in case of a d^2 metal ion in octahedral crystal field.
13. Explain the applications of Mossbauer spectroscopy in the study of Fe(V) and Fe(VI) nitride complexes.





14. Explain the photochemical reactions of Co(III).
15. What do you mean by nanomedicines? Explain the various applications.
16. Explain the role of metals and alloys in the storage of hydrogen.
17. Explain the role of metal organic frameworks in the separation and purification of gases.
18. Give an account of Diamondoid networks.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. Construct LGOs and draw the MO diagram of σ bonded tetrahedral complexes.
20. What is Electron paramagnetic resonance spectroscopy? Elaborate with reference to EPR spectrum of d^1 and d^9 transition metal ions.
21. Discuss about the terms a) Chemical actinometry b) photochemistry of metal-metal multiple bonds and c) Application of dissociative photochemistry
22. What are biosensors? How do they function? How does nanotechnology support designing the biosensors?

(2×5=10 weightage)

