



QP CODE: 23144839



Reg No : .....

Name : .....

**M Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2023**

**Third Semester**

Faculty of Science

**CORE - CH500301 - STRUCTURAL INORGANIC CHEMISTRY**

M Sc CHEMISTRY, M Sc ANALYTICAL CHEMISTRY, M Sc POLYMER CHEMISTRY

2019 ADMISSION ONWARDS

9C328A3D

Time: 3 Hours

Weightage: 30

**Part A (Short Answer Questions)**

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain the structure of Zinc blende.
2. What are the merits and demerits of quantum free electron theory?
3. What are Phosphors?
4. What is meant by Josephson's Junction?
5. What is the bonding in Phosphorus-Sulphur compounds?
6. Comment on the bonding in phosphorus cages.
7. What are Polygermanes?
8. What is topotaxy?
9. Explain any one method for zeolite synthesis.
10. Explain the term superparamagnetism of nanoparticles.

(8×1=8 weightage)

**Part B (Short Essay/Problems)**

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain the factors affecting solid state reactions.
12. Explain the Crystal growth mechanism using melt and vapour deposition technique.





13. What is Piezo electricity? Give its applications.
14. What is Meissner effect? Explain BCS theory of superconductivity and Cooper pairs .
15. Write a short note on isopoly acids of Molybdenum.
16. Describe the structure, synthesis and bonding in Diborane.
17. Write a short note on Cages and clusters of Germanium.
18. Write a short note on medical applications of Boron Clusters.

(6×2=12 weightage)

### **Part C (Essay Type Questions)**

*Answer any **two** questions.*

*Weight **5** each.*

19. Describe Phase transitions in solids. Distinguish between first and second order phase transitions.
20. a) Explain the mechanism of intrinsic and extrinsic semiconductors.  
b) Explain Hall effect and derive its equation.
21. a) Discuss about Condensation polymers based on Rigid rod Polyynes.  
b) Write a note on polymers with Organometallic moieties as Pendent groups
22. a) Discuss on Biomedical applications of Magnetic Nanoparticles  
b) Explain the use of magnetic nanoparticles in Magnetic Resonance Imaging (MRI) and Contrast Enhancement.

(2×5=10 weightage)

