QP CODE: 23002798

23002798

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, MARCH 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

43C98201

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain vacancy diffusion in solid state reactions.
2. How band gap and conductivity are interrelated in conductors and non-conductors ?
3. Why is $BaTiO_3$ ferroelectric?
4. Explain Meisner Effect.
5. Find the styx numbers for B_2H_6, and B_4H_{10}
6. What are boron cages?
7. What are Organometallic Dendrimers?
8. What is epitaxy?
9. What is thin film? What are its uses?
10. Explain Sputtering.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. What are spinels? How do they differ from inverse spinels?
12. Discuss about phase transition in solids. Explain the different phase transition mechanisms.
13. Write a brief note on free electron theory of metallic bonding and its disadvantages.

14. Describe the optical properties of solids.

15. Write a short note on isopoly acids of Vanadium.

16. Explain the structure and bonding in Sulphur-Nitrogen compounds.

17. Write a short note on clusters of Tin.

18. Write a short note on the application of C_2B_{10} as nucleic acid precursors and DNA binders .

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain the different techniques for growing single crystals.

20. Write short notes on:
    a) fullerenes b) carbon nanotubes c) graphenes d) conventional superconductors e) organic superconductors?

21. a) Write a note on polymers with Organometallic moieties as Pendent groups
    b) Explain condensation polymers based on ferrocene and on rigid rod polyynes.

22. What are Magnetic Nanoparticles? Disuss in detail about their various applications in Biomedical field.

(2×5=10 weightage)