QP CODE: 24044858

24044858

Reg No : .....

Name : .....

M.Sc DEGREE (CSS) EXAMINATION, OCTOBER 2024

Third Semester

CORE - CH500301 - STRUCTURAL INORGANIC CHEMISTRY

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

2019 ADMISSION ONWARDS

FFB3BD9C

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. Comment on the magnetic properties of illmenites and perovskites.
3. Differentiate between Type I and Type II Superconductors.
4. Define Josephson junction.
5. What are Zeolites? Give any two applications.
6. What are clusters of lead?
7. Give two examples for organometallic condensation polymers based on rigid rod polyynes.
8. How is Indium Tin Oxide coatings prepared?
9. What is thin film? What are its uses?
10. Write a short note on Superparamagnetism.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Distinguish between Zinc blende and Wurtzite structures.
12. Explain sintering.
13. Apply band theory to fullerenes and explain its properties.

14. Discuss super conductivity of YBaCu oxide system.

15. Write a short note on the heteropoly acids of Tungsten.

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

17. Discuss about Boron cages.

18. Write a short note on Nucleic acid precursors using Boron Clusters.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Elaborate in detail on phase transitions in solids with emphasis to first order and second order transitions.

20. a) Discuss on Hall effect and arrive at an equation.
    b) Discuss the mechanism of intrinsic and extrinsic semiconductors.

21. Discuss briefly on:
    a) Thermal Ring-opening Polymerization. b) Anionic Ring-opening Polymerization. c) Transition Metal Catalyzed Ring-opening Polymerization.

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)