TM243158T

Reg. No :.....

Name :.....

MASTER'S DEGREE (C.S.S) EXAMINATION, NOVEMBER 2024

2023 ADMISSIONS REGULAR

SEMESTER III - CORE COURSE CHEMISTRY

CH3C09TM20 - Structural Inorganic Chemistry

Time : 3 Hours **Maximum Weight : 30**

Part A

I. Answer any Eight questions. Each question carries 1 weight **(8x1=8)**

1. Describe Sintering.
2. Describe first order phase transitions in solids.
3. Discuss on organic superconductors and give some examples for organic superconducting materials.
4. Discuss on the application of Meissner effect in superconductors.
5. Explain with example the cages and clusters of germanium compounds.
6. Deduce the styx number for B_5H_9 and B_2H_6.
7. Write short note on organometallic dendrimers.
8. Discuss the important applications of organometallic polymers.
9. Explain the synthesis of zeolites by sol-gel method.
10. Describe the synthesis of indium tin oxide.

Part B

II. Answer any Six questions. Each question carries 2 weight **(6x2=12)**

11. Discuss the structure of Nickel arsenide and ilmenite structure.
12. Distinguish between spinel and inverse spinel structure with example.
13. Explain piezoelectric effect and applications of piezoelectric crystals.
14. Explain hall effect and derive an equation for an electron in an electric field.
15. Give the styx number for following compounds (a) B_3H_9 (b) B_5H_{11} and (c) B_6H_{10}.
16. Compare the clusters of Indium and gallium.
17. Outline transition metal catalysed ring opening polymerization of [1] ferrocenophanes.
18. Explain alkynyl ligand exchange and ammine free synthesis for the preparation of organometallic polymers based on rigid rod polyynes.

Part C

III. Answer any Two questions. Each question carries 5 weight **(2x5=10)**

19. (a) Discuss the different factors that influence solid state reactions. (b) Explain any one method for growing single crystals.
20. (a) Summarize the magnetic properties in garnets, spinels and ilmenites. (b) Discuss the various applications of optical properties in phosphors, solid state lasers and solar cells.
21. Explain the cages and clusters of tin, lead and tellurium.
22. Discuss the applications of magnetic nanoparticle: (a) data storage (b) Magnetic resonance (c) Biomedical field.