

M.Sc. DEGREE (C.S.S.) EXAMINATION, JANUARY 2016**Third Semester**

Faculty of Science

Branch III : Chemistry

AN3 C09/CH3 C09/PO3 C09—STRUCTURAL INORGANIC CHEMISTRY

(Common to M.Sc. Analytical Chemistry, Chemistry and Polymer Chemistry)

[2012 Admission onwards]

Time : Three Hours

Maximum Weight : 30

Section A

*Answer any **ten** questions.
Each question carries a weight of 1.*

1. Explain Martensitic transformation with an example.
2. What are phosphors ? Explain its application in the working of fluorescent lamps.
3. Borazines is called inorganic benzene. Why ?
4. What are fiber glass and safety glass ?
5. Mention the salient features of the structure of polyphosphazene.
6. Based on band theory, explain the electrical properties of metallic beryllium.
7. Give the structure of Perovskite.
8. What do you mean by Meisner effect ?
9. What is Hall Effect ?
10. What are the heteropoly acids by the molybdenum at different P_H ?
11. Predict the structure of $C_2B_{10}H_{12}$ using Wades rule ?
12. Explain the superconductivity of fullerenes.
13. How silicones are prepared ? Account or their water repellent nature.

(10 × 1 = 10)

Section B

*Answer any **five** questions.
Each question carries a weight of 2.*

14. How will You distinguish between Fluorite and Ant fluorite structures ? Explain.
15. What are the factors influencing solid state reactions ?

Turn over

16. Write brief on free electron theory of metallic bonding.
17. How are carboranes classified ? Write on their structures.
18. Explain the dislocations in line defect of crystals.
19. State the Wade Mingos Lauher rule with suitable example.
20. Briefly explain the kinetics of phase transitions in solids.
21. Write note on : (a) Polyatomic Zintl anion and cations ; and (b) Tetranuclear metal clusters.

(5 × 2 = 10)

Section C

*Answer any two questions.
Each question carries a weight of 5.*

22. (a) Give a brief account of high temperature superconductors.
(b) Explain the BCS theory.
23. (a) How is $[\text{Re}_2\text{Cl}_8]^{2-}$ Synthesised ? Explain the characteristics features in bonding. Mention the evidence of M-M bond in it.
(b) Write briefly on sulphur-nitrogen ring and chain compounds.
24. (a) Describe the structure, synthesis and bonding in diborane.
(b) Briefly explain the Zone theory.
25. Give a brief account of the magnetic and optical properties of metals.

(2 × 5 = 10)