

19002220



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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, NOVEMBER 2019

Third Semester

Faculty of Science

Branch III : Pure Chemistry

CH3 C09/AN 3C 09/PO 3C 09—STRUCTURAL INORGANIC CHEMISTRY

[Common to M.Sc. Analytical Chemistry, Pure Chemistry and Polymer Chemistry]

(2012—2018 Admissions)

Time : Three Hours

Maximum Weight : 30

Section A

*Answer any **ten** questions.*

Each question carries a weight of 1.

1. What is H and V centres in crystals ? How they are detected ?
2. Explain the First order phase transitions in solids using a suitable example.
3. What is deep level transient spectroscopy ? What is its use ?
4. Give one example each for : (a) Line defects (b) Plane defects.
5. What are Kronig fine structures ? What is its use ?
6. What is Hall Effect ? What is its use ?
7. Differentiate between metals, insulators and semiconductors taking band structure.
8. What are the differences between Intrinsic and extrinsic semiconductors ?
9. Calculate the Styx numbers of : (a) B_2H_6 (b) B_5H_{11} .
10. Give the nonnumeric structures of : (a) Silicon oils (b) Phosphazene.
11. What are Brillouin zones ? Explain.
12. Give one example each : (a) Tecto (frame work) silicates (b) Phyllosilicates.
13. List the 5 important classes of silicates.

(10 × 1 = 10)

Turn over





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Section B

*Answer any **five** questions.*

Each question carries a weight of 2.

14. Discuss briefly Zinc blend structure (AX type).
15. Explain Frenkel pair. What are the changes occurring to the physical and chemical properties of crystals due to their occurrence ?
16. What is sintering ? How it is brought out in crystals ?
17. Explain the free electron theory of metals
18. Write briefly on Isopoly acids of molybdenum
19. Why useful refractory materials may be prepared by heating china clay (kaolin) but not by heating montmorillonite clay ?
20. Why Borazine is called Inorganic benzene by Weberg ?
21. Explain the Jemmis 'mno' rule.

(5 × 2 = 10)

Section C

*Answer any **two** questions.*

Each question carries a weight of 5.

22. Discuss briefly on the metal clusters of Copper and Chromium
23. Write briefly on the homocyclic ring compounds of sulphur and Phosphorus.
24. Write notes on : (a) Fullerenes (b) High temperature super conductors.
25. (a) Explain the important techniques adopted for single crystal growth.
(b) How a single crystal rod of Silicon of high purity is prepared, provided a free choice of normal laboratory reagents and equipments ?

(2 × 5 = 10)

