

D1ACH2402

(2 Pages)

Name.....

Reg.No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(Regular/Improvement/Supplementary)

CHEMISTRY

FCHE1C02-ELEMENTARY INORGANIC CHEMISTRY

Time: 3 Hours

Maximum Weightage: 30

Section A: Short answer questions. Answer any *eight* questions. Each carries *one* weightage.

1. What is the Significance of Nuclear Reaction Cross Section?
2. Using Wade's rule classify the following compounds into closo, nido, arachno and hypo boranes.

a) B_4H_{10} b) $C_2B_3H_5$ c) B_5H_{11} d) $C_2B_3H_5Fe(CO)_3$
3. What are super heavy elements? How are they produced?
4. Discuss the structure of orthosilicates. Give examples for orthosilicates.
5. Bases that are weak in water may appear stronger in more strongly proton donating solvent. substantiate the statement with an example.
6. What are hypervalent compounds? Give examples.
7. Distinguish between Lewis concept and Lux-Flood concept of acids and bases.
8. Explain the application of bent's rule with example.
9. S_4N_4 is Puckered, whereas $[S_4N_4]^{2+}$ is planar. Why?
10. Write a note on super acids.
11. Bring out reasons for water repellent nature of silicones.
12. Discuss the application of Drago -Wayland Equation.

(8 × 1 = 8 weightage)

Section B: Short essay questions. Answer any *four* questions. Each carries *three* weightage.

13. Discuss the synthesis, structure and bonding in Borazine.
14. Give an account of the synthesis and structure of $(NPCl_2)_3$.
15. What information do we get from Ellingham diagrams? Explain.
16. Explain the principle and working of scintillation counters.

(P.T.O.)

17. Discuss the formation of $d\pi-p\pi$ bonds with an example.
18. What are Zeolites? Discuss any two important applications of Zeolites.
19. Discuss the postulates of VSEPR theory. What are its limitations in predicting the shapes of molecules.

(4 × 3 = 12 weightage)

Section C: Essay questions. Answer *any two* questions. Each carries *five* weightage.

20.
 - a) Write a note on the types of non-aqueous solvents.
 - b) What is Symbiosis? Explain with examples.
21.
 - a) Discuss the importance of icosahedral framework of boron atoms in boron chemistry.
 - b) Write note on sandwich type metallocarboranes
22. Give an account of the heteropoly and isopoly anions of W and Mo.
23. Elaborate the principle and instrumentation of neutron activation analysis. Mention its merits and demerits.

(2 × 5 = 10 weightage)