

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2021
(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 are Super acids? Mention their usages.
2. Explain the Drago-Wayland equation.
3. Which is more stable; B_2H_6 or $[B_2H_6]^{2-}$? Substantiate your answer.
4. Classify the following compounds into *closo/nido/arachino* structures:
(a) $C_2B_{10}H_{12}$ (b) $C_3B_3H_5$ and (c) B_4H_{10} .
5. How is polythiazyl prepared? Account for its metallic character.
6. Write action of diborane on: (a) CO and (b) PH_3 .
7. What is radiation dosimetry?
8. What are Scintillation counters? Give any two examples.
9. How silicones are prepared? Account for their water repellent nature.
10. What is Frost diagram? Explain the importance.
11. What is meant by hyper valence? Give example.
12. Explain the type of π bond involved in ClO_4^-

(8×1 = 8 weightage)

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

13. Write notes on Isopoly and heteropoly anions.
14. Describe various applications of HSAB concept.
15. Write briefly on metallocarboranes.
16. Derive *styx* code for B_4H_{10} and draw its structure.
17. Discuss the importance of neutron activation analysis.

(P.T.O.)

18. What are Pourbaix diagrams? Discuss applications.
19. Write salient features of liquid drop model.

(4×3 = 12 weightage)

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

20. Discuss the magnetic and spectral properties of lanthanides and actinides.
21. What are phosphazines? Explain preparation, properties and structure of $(\text{PNCl}_2)_3$. Mention their uses.
22. Discuss the Bent rule and energies involved in hybridisation.
23. Discuss the behaviour of liquid SO_2 and liquid NH_3 as solvents.

(2×5 = 10 weightage)