

23P111

(Pages: 2)

Name: .....

Reg.No: .....

**FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2023**

(CBCSS - PG)

(Regular/Supplementary/Improvement)

**CC19P CHE1 C02 - ELEMENTARY INORGANIC CHEMISTRY**

(Chemistry)

(2019 Admission onwards)

Time : 3 Hours

Maximum : 30 Weightage

**Section A**

Answer any *eight* questions. Each question carries 1 weightage.

1. What are the characteristics of hard and soft acid and bases?
2. What are interstitial carbides? Give an example.
3. What is the action of diborane on: a) CO b) NaH in diglyme ?
4. Give the structures of  $P_4O_8$  and  $P_4O_9$ .
5. Why aluminium is used to reduce the oxide of iron and chromium?
6. What is a Frost diagram? What information do we get from this diagram?
7. Explain the merits and demerits of Liquid drop model.
8. What are critical size and critical mass? Explain its importance in nuclear reactions.
9. Mention how nanomaterials are classified based on their dimension.
10. Describe template-assisted synthesis of nanomaterials.
11. Polythiazil behaves as a 1-D metal. Why?
12. What is targeted drug delivery? Explain.

**(8 × 1 = 8 Weightage)**

**Section B**

Answer any *four* questions. Each question carries 3 weightage.

13. Write a short note on alkali metal in liquid ammonia.
14. a) Write a note on superacids.  
b) Where is the acidic site in the  $SO_3$  molecule? Draw structures to explain your answer.
15. Explain hydroboration reaction with suitable example.
16. Write briefly on phosphazenes.

17. Describe the synthesis and structure of  $P_4S_{10}$ .
18. What are isopoly anions? Discuss the different isopoly anions formed by vanadium.
19. Give a brief account on how to characterize a quantum dot?

**(4 × 3 = 12 Weightage)**

### **Section C**

Answer any *two* questions. Each question carries 5 weightage.

20. Explain different acid base concepts with suitable examples and discuss their limitations.
21. Give an account of the synthesis, structure, bonding and uses of phosphorus-nitrogen and sulphur-nitrogen compounds.
22. (i) Discuss the magnetic and spectral properties of lanthanides. (ii) Write a notes on uranyl compounds
23. Explain in detail about electron microscopic technique for the characterization of nanomaterials.

**(2 × 5 = 10 Weightage)**

\*\*\*\*\*