24P111 (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(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. Which is expected to be a better Lewis acid: BCl_3 or $B(CH_3)_3$ Explain.
2. How is P_4O_{10} prepared? Give its structure.
3. What is Zeolite?
4. Polythiazil behaves as a 1-D metal. Why?
5. Distinguish isopoly anion from hetero poly anions.
6. Why aluminium is used to reduce the oxide of iron and chromium?
7. What are critical size and critical mass? Explain its importance in nuclear reactions.
8. What is coherent scattering? Explain.
9. What are the applications of X- ray photoelectron spectroscopy?
10. What are biosensers? Explain any one application.
11. Write down Lux-Flood definition of acids and bases. Give an example.
12. What are the types of beta decay? Give examples.

(8 × 1 = 8 Weightage)

Section B

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

13. Discuss the role of HF as a non-aqueous solvent.
14. Write briefly on metallocarboranes.
15. Write briefly on silicones.
16. Applying Wade's rules classify the following boranes by structural type. a) B_4H_{12} b) $B_{10}H_{15}$
17. Explain Pourbaux diagrams and discuss their applications.
18. On the basis of semi empirical mass equation, predict the stable nuclide of the isobaric series A=120

19. Write a brief note on Neutron activation analysis.

(4 × 3 = 12 Weightage)

Section C

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

20. Briefly discuss the HSAB theory of acids and bases and its applications.

21. Discuss the structure and bonding in Diborane. How it is synthesized? Explain its reaction with ammonia.

22. Explain Latimer and Frost diagrams. Discuss their applications.

23. Briefly describe various methods of nano material synthesis.

(2 × 5 = 10 Weightage)

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