25P111 (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2025

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19PCHE1C02 - 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. Arange BF_3, BI_3,BBr_3 and BCl_3 in the increasing order of acid structure. Justify your answer.
2. What are super acids? Explain using an example.
3. What are carboranes?
4. Write notes on diagonal relationship.
5. What is the action of borazine on HCl?
6. What are styx number?
7. Distinguish isopoly anion from hetero poly anions.
8. What is a Frost diagram? What information do we get from this diagram?
9. Explain the merits and demerits of Liquid drop model.
10. Differentiate photonuclear reactions from thermonuclear reactions.
11. What is lithography? Give two examples for photoresists used in lithographic applications.
12. How is graphene and rGO related?

(8 × 1 = 8 Weightage)

Section B

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

13. Fxplain the Drago- Wayland equation and the E, C parameters.
14. Derive the Styx code for B_2H_6.
15. How is S_2N_2 prepared? Discuss its structural characteristics.

16. Applying wade's rules classify the following boranes by structural type. a) B_4H_{10} b) B_4H_8

17. What are super heavy elements? Give two examples? Give the method of production of any two super heavy elements.

18. Write briefly on Scintillation detectors.

19. Write a short note on surface plasmon resonance (SPR).

(4 × 3 = 12 Weightage)

Section C

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

20. Discuss briefly the reactions which take place in non- aqueous sulphuric acid, SO_2, N_2O_4.

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

22. What is an Ellingham diagram? Discuss briefly about its applications and limitations.

23. What are the commonly employed top-down and botto-up approaches deployed in the synthesis of nanomaterials?

(2 × 5 = 10 Weightage)

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