

D 114539

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Name.....

Reg. No.....

**FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2024**

(CBCSS)

Chemistry

CHE 1C 02—ELEMENTARY INORGANIC CHEMISTRY

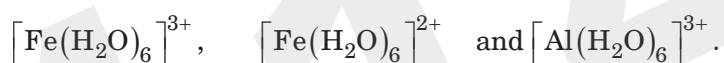
(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A*Answer any **eight** questions.**Each question carries a weightage of 1.*

1. Explain Usanovich concept of acids and bases.
2. Arrange the following species in the increasing order of acidity and give reasons for your answer.



3. What is the action of diborane on :

a) CO

b) dimethylether

4. Classify the following compounds into *Closo*, *Nido* and *Arachino* structures :

a) B_6H_{12} .b) B_5H_9 .c) B_5H_{11} .d) $\text{C}_2\text{B}_{10}\text{H}_{12}$.

5. What are sheet silicates ? Give two examples.
6. Account for the water-repellent nature of silicones.
7. What are Ellingham diagrams ? Account for the abrupt changes in these diagrams ?
8. What are super heavy elements ? How are they produced ?
9. Explain the nuclear fusion reactions taking place in sun.
10. Bring out the principle involved in the working of TEM.

(8 × 1 = 8 weightage)

Turn over

Section B

*Answer any **six** questions.*

Each question carries a weightage of 2.

11. Comment on the levelling effect of solvents with suitable examples.
12. Give a brief account of the sandwich type metallocarboranes.
13. Give an account of the classification of carbides, giving examples.
14. Write a note on trans-actinide elements.
15. Discuss the principle involved in neutron activation analysis.
16. Describe the theory and working of AFM.
17. How is graphene synthesised ?
18. Write briefly on the isopoly anions of W and Mo.

(6 × 2 = 12 weightage)

Section C

*Answer any **two** questions.*

Each question carries a weightage of 5.

19. Discuss the acid-base reactions and precipitation reactions in liquid ammonia as a solvent. What are the advantages and disadvantages of using liquid ammonia as a solvent.
20. How do you prepare the different isomers of dicarba-*closo*-dodecaborane(12) ? Comment on the acidity of the different types of hydrogen atoms present in carboranes.
21. Describe the synthesis of $(\text{NPCl}_2)_3$. How is it converted into phospham ? Discuss the structure and bonding in this compound.
22. Explain the principle of a nuclear reactor. Write briefly on radiation protection and radioactive waste disposal in an atomic power plant.

(2 × 5 = 10 weightage)