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(Pages : 2)

Name.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2020

(CBCSS)

Chemistry

CHE 1C 02—ELEMENTARY INORGANIC CHEMISTRY

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

Answer any **eight** *questions.*

Each question carries a weightage of 1.

1. The electrical conductivity of liquid ammonia is increased when ammonium chloride is dissolved in it ; why ?
2. What is symbiosis ? Explain.
3. Classify the following into *closo / nido / arachno* structures :

   a) B_5H_9 b) $(B_8H_8)^{2-}$ c) $C_2B_3H_5$ d) B_4H_{10}
4. Discuss the consequences of isomorphous substitution in silicates.
5. Explain, why $P_4N_4Cl_8$ is puckered while $P_4N_4F_8$ is planar ?
6. What are interstitial carbides ? Give examples.
7. What are Ellingham diagrams ? Account for the abrupt changes in these diagrams.
8. What is the significance of 'Q' values in nuclear reactions ?
9. How is uranyl sulphate prepared ? Give the equation.
10. Comment on the size-dependent properties of cadmium selenide.

(8 × 1 = 8 weightage)

Turn over

Section B

Answer any **six** *questions.*

Each question carries a weightage of 2.

11. Explain Lux-Flood theory of acids and bases.

12. What are Frost diagrams ? Discuss their applications.

13. How do substituted borazines are prepared ? Give a brief account of the structure and bonding in borazine.

14. Give a brief account of the synthesis, structure and properties of $(SN)_X$, S_2N_2 and S_4N_4.

15. Discuss the principle involved in neutron activation analysis.

16. Write a note on trans-actinide elements.

17. How do graphenes differ from fullerenes ?

18. Write briefly on diagnostic and therapeutic applications of nanomaterials.

(6 × 2 = 12 weightag

Section C

Answer any **two** *questions.*

Each question carries a weightage of 5.

19. Give the important characteristics of ammonia as a solvent. Discuss briefly, the precipitation reacti that occur in ammonia.

20. How is 1, 2-dicarba-closo-dodecaborane(12) prepared ? Write a note on its isomerism. Compare t acidity of the different types of hydrogen atoms present in carboranes.

21. a) Write an account on the synthesis, structure and uses of silicones.

    b) Write briefly on the classification of carbides.

22. Write an account on heteropoly and isopoly anions of W and Mo.

(2 × 5 = 10 weightag