D1BCH2101 (S3) **Reg. No.....**

Name: .....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(Improvement/Supplementary)

CHEMISTRY

GCHE1B01T: THEORETICAL AND INORGANIC CHEMISTRY- I

Time: 2 Hours **Maximum Marks: 60**

SECTION A: Answer the following questions. Each carries *two* marks. (Ceiling 20 marks)

1. Distinguish between acidimetry and alkalimetry.
2. Define binding energy of the nucleus.
3. Among the atoms represented by the following electronic configurations, which would have the lowest ionization enthalpy: 1s2 2s2 2p6; 1s2 2s2 2p5; 1s2 2s2 2p63s1? Explain.
4. Explain the variation of electron affinity down a group.
5. What is the state of hybridisation of O in H_3O+ ion?
6. Draw the structure of diborane.
7. Concentrated sulphuric acid is a strong dehydrating agent. Explain.
8. Which alkali metal has the most negative reduction potential (EoM+/M) and which has the least?
9. Name two metal ion indicators.
10. Give two examples each for behavioral sciences and social sciences.
11. Define Avogadro number. What is its value? What is meant by the term molar mass?
12. Name and formulate an oxide of phosphorus and draw its structure.

SECTION B: Answer the following questions. Each carries *five* marks. (Ceiling 30 marks)

13. Correlate the N/P ratio and nuclear stability.
14. Briefly explain how an adsorption indicator functions.
15. Discuss the general characteristics of the f-block elements.
16. Discuss the important properties of diborane.
17. What is a scientific statement? What are the criteria for a good scientific statement?
18. For titrating 10 ml of a solution with the help of a microburette, the volume of the titrant used are 9.98, 9.99, 9.98, 9.95, 10.00 and 10.02 ml. Calculate the mean, median and standard deviation.
19. Explain the shapes of (i) ammonia molecule and(ii) SF6 on the basis of VSEPR theory.

SECTION C: Answer any *one* question. The question carries *ten* marks.

20. What are the different types of hybridisations involving s, p and d orbitals? Explain the geometry of IF7 on the basis of hybridization.
21. (a)Write a note on nuclear fission and nuclear fusion.
    (b) Explain the principle of atom bomb.

(1 x 10 = 10 Marks)