

**23I103S**

(Pages: 2)

Name: .....

Reg. No.....

**FIRST SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, NOV. 2023**

(CBCSS-UG)

**CC20 CHE1 IC01 - GENERAL CHEMISTRY**

(Chemistry)

(2020 to 2021 Admissions – Supplementary/Improvement)

Time: 2.5 Hours

Maximum: 80 Marks

Credit: 4

**PART A**

Answer *all* questions. Each question carries 2 marks.

1. Define the term atomic mass unit.
2. What is redox indicator? Give an example.
3. Give any two limitations of Bohr's theory.
4. Explain de Broglie's concept of matter waves with evidences.
5. Explain the magnetic behaviour of  $C_2$ , on the basis of molecular orbital theory.
6. What is meant by Resonance effect?
7. What are free radicals? How they formed?
8. Define heat capacity.
9. State third law of thermodynamics.
10. Calculate the RMS velocity of  $H_2$  molecules at  $27^\circ C$ .
11. Give the Bragg equation and state the terms involved.
12. Define the term vapour pressure of a liquid.
13. Define the term osmotic pressure.
14. What are fuel cells? Schematically depict  $H_2$ - $O_2$  fuel cell.
15. Explain the term EMF of a cell.

**(Ceiling: 25 Marks)**

**PART B**

Answer *all* questions. Each question carries 5 marks.

16. Distinguish between the terms valency and oxidation number.
17. Discuss the Heisenberg uncertainty principle.
18. Explain the different kinds of bond fission observed in organic reactions.
19. Calculate the change in entropy taking place when 27.3 KJ of heat transferred to a system at 273 K isothermally and reversibly.
20. Explain the significance of the van der Waals' constants a and b.
21. Explain the variation of vapour pressure of liquid with temperature.

22. State and explain Henry's law. What are the limitations.

23. Discuss the standard hydrogen electrode.

**(Ceiling: 35 Marks)**

**PART C**

Answer any *two* questions. Each question carries 10 marks.

24. Discuss briefly the principle underlying the separation of cations into groups in qualitative analysis.

25. What are quantum numbers? Discuss the significance of each quantum number.

26. Discuss the deviations of real gases from Boyle's law and Charles's law.

27. Explain the principle and advantages of conductometric titrations and illustrate it with reference to any two types of acid-base titrations.

**(2 × 10 = 20 Marks)**

\*\*\*\*\*