

21U118

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Name:

Reg.No:

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U CHE1 C01 - GENERAL CHEMISTRY

(Chemistry - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

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

1. What is meant by the term molar mass?
2. Explain the term equivalent mass of an reductant with suitable example.
3. Distinguish between accuracy and precision.
4. Sketch the shapes of Px, Py, and Pz, orbitals.
5. What are the geometries associated with (i) sp³ hybridization and (ii) sp hybridization?
6. Explain the very high bond dissociation enthalpy of N₂, molecule on the basis of MOT.
7. Bi-210 decays by β-emission. What is the product formed and in which group of the periodic table will it lie?
8. Explain the term isotopes with suitable examples.
9. Mention any three applications of radioisotopes in medicine.
10. What elements are referred to as bulk elements in bioinorganic chemistry ?
11. What are the functions of iron metal in biological system?
12. What is the function of carbonic anhydrase?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Two solutions of a substance (non-electrolyte) are mixed in the following manner. 480ml of 1.5M first solution + 520ml of 1.2M second solution. What is the molarity of the final solution?

14. Discuss the theory of complexometric titrations.
15. Calculate the lattice energy of calcium fluoride (CaF_2) from the following data: Madelung constant = 2.519; ionic radii: $\text{Ca}^{2+} = 0.99 \text{ \AA}$, $\text{F}^- = 1.36 \text{ \AA}$; Born exponent = 7; electronic charge = $1.6022 \times 10^{-19} \text{ C}$; $\epsilon_0 = 8.854 \times 10^{-12} \text{ C}^2 \text{ m}^{-1} \text{ J}^{-1}$
16. Give the shapes of the following molecules on the basis of the VSEPR theory: (i) BeCl_2 (ii) BF_3 (iii) SnCl_2
17. Explain the terms binding energy and binding energy per nucleon.
18. Distinguish between nuclear fission and nuclear fusion
19. Briefly explain photosynthesis.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Explain the principle regarding the choice of suitable indicators in different acid-base titrations.
21. Discuss with illustrative examples the rules that determine the ground state electronic configurations of atoms.

(1 × 10 = 10 Marks)
