

22U115

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Name: .....

Reg.No: .....

**FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022**

(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. Define Avogadro number. What is its value?
2. Explain the term equivalent mass of a reductant with suitable example.
3. Name three indicators used in acid-base titrations. Indicate the pH range over which they change colour.
4. Write the electronic configurations of Cu and Cr.
5. What are the H-N-H bond angles in the ammonium ion?
6. Explain the magnetic behavior of  $C_2$ , on the basis of molecular orbital theory
7. Calculate the mass defect in the case of a helium nucleus formation if the masses of proton, neutron and helium nucleus are respectively 1.00758 amu, 1.00897 amu and 4.00820 amu
8. What is a fission chain reaction? Mention how it can be used for peaceful purposes.
9. Mention any three applications of radioisotopes in medicine.
10. What is haemerythrin?
11. What is the oxidation state and coordination number of Fe in haemoglobin?
12. What is the biological function of methylcobalamin?

**(Ceiling: 20 Marks)**

**Part B** (Short essay questions - Paragraph)

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

13. Explain the term molarity of a solution. Calculate the molarity of an aqueous solution containing 15.9g of anhydrous sodium carbonate in 3 litre.
14. Explain the principle of double burette method used in titrimetry with a suitable example.

15. Calculate the kinetic energy of a moving electron which has a wavelength of 4.8 pm. Mass of electron =  $9.1 \times 10^{-31}$  kg.
16. Discuss sp<sup>3</sup>d<sup>2</sup> hybridization and the consequent geometry with an illustrative example.
17. Discuss the distinguishing characteristics of the different types of radioactive rays.
18. Explain the terms isobars and isotones with suitable examples.
19. Write a short note on the role of chlorophyll in photosynthesis.

**(Ceiling: 30 Marks)**

**Part C (Essay questions)**

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

20. Explain:
  - (i) the action of diphenylamine as redox indicator.
  - (ii) self indicator action of potassium permanganate in permanganometry.
  - (iii) external indicator method and internal indicator method used in dichrometric titrations.
21. What is Born-Haber cycle ? Discuss with respect to NaCl.

**(1 × 10 = 10 Marks)**

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