24U124S (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - UG)

CC19U CHE1 C01 - GENERAL CHEMISTRY

(Chemistry - Complementary Course)

(2019 to 2023 Admissions - Supplementary/Improvement)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

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

1. Define the term molar mass. What is the value of the molar volume of a gas behaving ideally at 273.13K and 1 atm?
2. Define molarity of a solution
3. What are redox titrations? Give an example.
4. Calculate the wavelength of the matter wave associated with an electron (mass=9.1 x 10-28 g) moving with a velocity of 1010 cm /s
5. Sketch the shapes of Px, Py, and Pz, orbitals. ?
6. Identify the major type of intermolecular forces present (i) in HCI, and (ii) in a system of HCI and benzene molecules,
7. Write the nucler equation for (i) the emision of an α-particle from Th-232 (ii) the emission of a β-particle from Ra-228.
8. What are isotones? Give an example.
9. What is the essential difference between nuclear fission and nuclear fusion?
10. Name two transition metals that play important functional roles in biological processes.
11. What are the functions of iron metal in biological system?
12. Name any 2 zinc containing enzymes and mention its function.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. What are the characteristics that a primary standard should possess?
14. Describe how solubility product principle and common ion effect are applied to qualitative inorganic analysis.

15. calculate the Madelung constant for MgO from the following data: Equilibrium internuclear distance = 0.21 nm: Born exponent = 7, electronic charge = 1.6022 x 10 -19 C Ɛ0 = 8.854 x 10-12 C2 m -1 J-1, lattice energy =-3940 kJ /mol

16. Discuss the differences between sigma and pi bonds.

17. Write a short note on nuclear exchange forces Explain the meson field theory of nuclear forces.

18. Discuss rock dating

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. Define oxidation number. Discuss the oxidation number concept of oxidationand reduction. Explain the terms oxidant and reductant with an illustrative example for a redox reaction.

21. State the postulates of VSEPR theory. Apply the theory to predict the shape of CIF3.

(1 × 10 = 10 Marks)

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