Reg. No ..... Name **20U143**

B. Sc DEGREE END SEMESTER EXAMINATION - OCT. 2020 : FEBRUARY 2021

SEMESTER 1 : COMPLEMENTARY CHEMISTRY FOR B Sc PHYSICS, BOTANY & ZOOLOGY

COURSE : **19U1CPCHE1 : GENERAL CHEMISTRY**

(For Regular - 2020 Admission & Improvement / Supplementary - 2019 Admission)

Time : Three Hours Max. Marks: 60

PART A

Answer All (1 mark each)

1. Name a radioisotope used as tracer in medicine.
2. Concordance between the experimental result and the true or most probable value is called…….
3. Write two examples for primary standard.
4. The total energy of the universe is ……
5. Unit of enthalpy is ……..
6. Each of the d orbital possess ……. nodal planes.
7. Name one example for an acidic buffer.
8. Name two examples for Lewis acid.

(1 x 8 = 8)

PART B

Answer any 6 (2 marks each)

9. Find out the packing fraction of , if actual isotopic mass of argon is 39.962384 amu.
10. Calculate the normality of 10 % solution of NaOH
11. Mention any four characteristics of entropy?
12. State the third law of thermodynamics
13. State and explain photoelectric effect.
14. Define an orbital
15. What is Lowry-Bronsted concept of acids and bases?
16. What is the pH of 0.2 N NaOH?

(2 x 6 = 12)

PART C

Answer any 4 (5 marks each)

17. What are the components of a nuclear reactor?
18. What are errors? Discuss in detail about the classification of errors
19. State and explain first law of thermodynamics. What are the important limitations of first law of thermodynamics?
20. What is de Broglie relation? Moving with the same velocity will an electron or proton be associated with a larger wavelength. Why?
21. Discuss on principle and spin quantum number.
22. Explain the terms solubility and solubility product? Discuss important applications of solubility product.

(5 x 4 = 20)

PART D

Answer any 2 (10 marks each)

23. a) Explain Radio carbon dating?
    b) Discuss nuclear fission and fusion.
    c) The amount of 14C in a sample of wood is found to be one-third of its amount present in a fresh piece of wood. Calculate the age of wood ($t_{1/2}$ = 5577 years).

24. Discuss the concept of Gibbs free energy? What is the effect of temperature on spontaneity of a reaction?

25. a) Discuss on: (i) Paulis exclusion principle (ii) Afbau Principle (iii) Hund's rule of maximum multiplicity (6marks)

    b) Calculate frequency and wave length corresponding to the spectral line of lowest frequency in Lyman series in the spectra of hydrogen atom.

    Given R = 1.09678×10^{-7} m^{-1},C = $3 \times 10^{8} ms^{-1}$ (4marks)

26. a) Discuss on buffer solutions? How are they classified? Explain the action of an acidic buffer. Represent Henderson equation for basic buffer (7marks)

    b) Calculate the H^{+} ion concentration of a solution of pH = 4 (3 marks)

(10 x 2 = 20)