

TB221070V

Reg. No :

Name :

B. Sc. DEGREE (C.B.C.S.) EXAMINATION, NOVEMBER 2022
(2022 Admissions (regular) 2021 Admissions (Improvement / Supplementary), 2020, 2019, 2018, Admissions
Supplementary)

SEMESTER I - COMPLEMENTARY COURSE 1 (CHEMISTRY)

(Common For Botany, Zoology and H. Sc.)

CH1C01B18 - BASIC THEORETICAL AND ANALYTICAL CHEMISTRY

Time : 3 Hours

Maximum Marks : 60

Part A

I. Answer any Ten questions. Each question carries 1 mark

(10x1=10)

1. Define node. Predict the number of nodes present on 3s orbital.
2. Define hybridization
3. Cite an example for intermolecular hydrogen bonding.
4. Define periodicity in properties.
5. Identify the most electropositive element in the periodic table.
6. Compute the concentration of H⁺ ions whose pH is 2.
7. Recognize the colour shown by Methyl Orange in acidic medium and basic medium respectively.
8. In gravimetric analysis identify the form to which analyte is converted to during estimation.
9. Define the term analyte.
10. Recall the advantages of GLC.
11. Identify the chromatography technique which can be controlled by the variation in pH.
12. Compare and contrast column chromatography and a thin layer chromatography.

Part B

II. Answer any Six questions. Each question carries 5 marks

(6x5=30)

13. Describe the shapes of orbitals with its pictorial representation.
14. Explain the shape of ammonia and water molecules using VSEPR theory.
15. Explain briefly on the strength of acids and bases.
16. Calculate the degree of ionisation of 0.01 M solution of HCN. K_a for HCN is 4.8×10^{-10} . Also calculate the concentration of hydronium ion concentration.
17. Explain primary and secondary standards. Discuss the criteria for a substance to qualify as a primary standard. Give any two examples of primary standard.
18. Explain briefly the preparation of standard solutions. Calculate the weight of Sodium Carbonate required to prepare 250 ml of 0.025 M Sodium Carbonate Solution.
19. Explain the separation process involved in gas-liquid chromatography technique with diagram.
20. Discuss the principle and classification of chromatography.
21. Explain the principle and uses of paper chromatography technique.

Part C

III. Answer any Two questions. Each question carries 10 marks

(2x10=20)

22. a) Illustrate different types of overlapping in the formation of single and multiple bonds with suitable examples.
b) Briefly describe VSEPR theory.
23. a) Derive de Broglie wave equation and explain dual nature of matter. b) Explain photoelectric effect and kinetic energy photoelectron.
24. a) Discuss the long form of the periodic table b) differentiate between electronegativity and electron affinity
25. Describe the process of gravimetric analysis. Discuss the optimum conditions for efficient precipitation in gravimetric analysis.