

Roll No.

Total Pages : 3

322404

May 2023

**B.Sc. (Chemistry) IV SEMESTER
Basic Analytical Chemistry (SECC-01)**

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) What do you understand by Alkalinity of water and what is its unit? (1.5)
(b) What do you understand by Complexometric titrations? (1.5)
(c) What is Humus in soil? (1.5)
(d) What do you understand by pH? (1.5)
(e) What do you understand by accuracy? (1.5)
(f) What is the principle of ion-exchange chromatography? (1.5)
(g) How will you confirm that a given water sample is acidic or basic? (1.5)
(h) What is sampling? (1.5)

322404/80/111/450

115 [P.T.O.]

- (i) Write any *three* characteristics for ideal gasoline. (1.5)
- (j) Comment on pure water. (1.5)

PART-B

2. (a) Write a note on following : (6+6)
- (i) Use of phenolphthalein in trap cases.
- (ii) Sources of error in analytical measurements.
- (b) What do you understand by Significant Figure? How many significant figures are present in 1.51, 1.510, 0.151 and plank constant? (3)
3. (a) (i) A sample of water on analysis is found to contain 4 mg/lit $\text{Ca}(\text{HCO}_3)_2$, 8 mg/lit CaSO_4 , and 12 mg/lit of MgCl_2 . Calculate temporary, permanent, and total hardness of water. [Given: Molecular weight of $\text{Ca}(\text{HCO}_3)_2 = 162$, Molecular weight of $\text{CaSO}_4 = 136$, Molecular weight of $\text{MgCl}_2 = 95$]. (6+4=10)
- (ii) The bathroom scale shows that Eli weighs 47 pounds, but Eli's actual weight is 45.5 pounds. Find the absolute error and relative error of this measurement. (6+4=10)
- (b) What are arson accelerants? How they help in investigation. (5)
4. What is the basic principle of flame photometry? How you will determine and estimate the Potassium, Calcium, Magnesium macro nutrients in soil samples by flame photometry? Explain with conceptual details. (15)

5. (a) How will you spectrophotometrically identify and determine the Benzoic Acid in Soft Drink? (5)
- (b) What do you understand by Gravitation water, Capillary water, Hygroscopic water, Water vapour, and Combined water? (10)
6. (a) What do you understand by paper chromatography? Write its principle. How will you separate a mixture of nickel and cobalt metal ions by paper chromatography? (10)
- (b) What is the cause of acidity in water? How will you determine the methyl orange acidity of a given water sample, explain in brief? (5)
7. What is the difference between Temporary and Permanent Hardness and how will you recognize whether water is hard or not? Discuss any *three* methods to remove the permanent Hardness of water. (15)