

- d) Name and describe two methods of food processing. What are the major drawbacks of food processing? Define alkalinity and discuss its importance in evaluating water quality. What are the essential nutrients for plant growth found in the soil? 3+2+1+2+2
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U.G. 3rd Semester Examination - 2024

CHEMISTRY

[PROGRAMME]

Skill Enhancement Course (SEC)

Course Code : CHEM-G-SEC-T-1

[CBCS]

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **five** questions: 2×5=10
- a) The result of an analysis is 32.83 gm. compared with the accepted value of 33.05gm. What is the relative error in parts per thousand?
 - b) 'Complexometric titration is dependent on pH'... Explain.
 - c) What are the essential criteria for selection of suitable solvents for paper chromatography?
 - d) What is masking agent in complexometric titration?

- e) What is retention factor in thin layer chromatography?
- f) What is the basic difference between Cluster sampling and Stratified sampling?
- g) What do you mean by reliability and validity of analytical measurement?
- h) What is metallic adulteration? Give two examples.

2. Answer any **two** questions: $5 \times 2 = 10$

- a) What is food adulteration? Explain the various types of adulterations that can be found in food. $2+3$
- b) What do you mean by ion exchange capacity? What is Zeolite? How does it remove the hardness of water? $2+1+2$
- c) Compare the advantages and disadvantages of paper chromatography and thin layer chromatography. Discuss the effect of pH on chromatographic separation of amino acids. $3+2$
- d) i) The laboratory performs replicate measurements on a standard solution with a known concentration of 100 units/mL. The results of 10 replicate measurements are as follows (in units/mL): 98.4, 99.1,

100.4, 100.1, 99.9, 100.1, 99.4, 101.1, 100.2, and 99.8. Calculate (i) Mean and (ii) Standard deviation. 3

- ii) Provide examples of how a poorly designed sampling protocol can impact the validity of results. 2

3. Answer any **two** questions: $10 \times 2 = 20$

- a) How does pH affect the composition of soil? What is the main composition of gasoline? Write down three effective ways to purify water. Why it is important to have water-quality standard and guidelines? What are the advantages and disadvantages of flame photometry? $1+1+3+2+3$
- b) Describe the principle of gas chromatography. Give the schematic diagram of a gas chromatography. What are the advantages and disadvantages of this technique? $4+3+3$
- c) Explain the significance of stationary phase and mobile phase in chromatography. How do these phases contribute to the separation of components in a mixture? What is ion exchange capacity of resins? Write down at least two commonly used indicators in complexometric titrations and explain how they function in detecting the endpoint. $3+2+2+1+2$