

(FOR THE CANDIDATES ADMITTED

SUBCODE 23UCY6E7

DURING THE ACADEMIC YEAR 2023-2024 ONLY)

REG.NO.:

N.G.M. COLLEGE (AUTONOMOUS): POLLACHI

END-OF-SEMESTER EXAMINATIONS: MAY 2026

B.Sc (CHEMISTRY)

MAXIMUM MARKS: 75

SEMESTER VI

TIME: 3 HOURS

PART - III

23UCY6E7 – DSC - III: ANALYTICAL CHEMISTRY - II

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

(K1)

1. IR spectroscopy operates in the range: _____

a) 200–400 nm b) 400–800 nm c) 4000–400 cm^{-1} d) 1–10 nm

2. In chelation extraction, the solute forms: _____

a) Solvate b) Ion-pair c) Chelate complex d) Redox species

3. The pH at the equivalence points of a weak acid–strong base titration is: _____

a) 7 b) <7 c) >7 d) 0

4. Which is a self-indicator in redox titrations?

a) Ferroin b) Starch c) KMnO_4 d) Murexide

5. Iodine solution is used to detect: _____

a) Protein b) Starch c) Fat d) Salt

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

(K2)

6. What is UV region wavelength range?

7. Give an example of extraction by solvation

8. State the colour change of phenolphthalein

9. What is the main use of Volhard's method?

10. How is alkalinity of water determined?

SECTION – B

(5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Explain the principle and applications of UV-Visible spectroscopy

(OR)

b) Outline the applications of IR spectroscopy

12. a) Distinguish extraction by solvation and extraction by chelation with example

(OR)

b) Analyze why the efficiency of a solvent extraction process depends on the distribution coefficient and the nature of the solvent system

13. a) Construct the titration curve of a weak acid with a strong base

(OR)

b) Describe the preparation of an acidic buffer solution.

14. a) Show the principle of permanganometric titration and give an example
(OR)
b) Find the theory of complexometric titrations

15. a) List the methods of water purification
(OR)
b) Explain food adulteration and its importance

SECTION – C

(5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4 (Or) K5)

16. a) Estimate the the instrumentation and working of UV-Visible spectrophotometer
(OR)
b) Describe the instrumentation of IR spectrophotometer and give characteristic absorption bands of Alcohols and Phenols
17. a) Compare and contrast liquid-liquid extraction and solid-liquid extraction
(OR)
b) Evaluate the factors affecting the extraction of organic compounds from non-aqueous media
18. a) Illustrate the buffer solutions, their mechanism and derive Henderson–Hasselbalch equation
(OR)
b) Discuss the choice of indicators in different acid-base titrations with examples
19. a) Describe indicators for EDTA titration and explain the determination of total hardness of water
(OR)
b) Determine the indicators used and describe the Volhard method for chloride estimation
20. a) Evaluate water analysis in detail
(OR)
b) Investigate the analysis of food products.
