



NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE
EXPRESS WAY,
JABI - ABUJA.
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
2024 1 EXAMINATION

COURSE CODE: CHM 306
COURSE TITLE: INSTRUMENTAL METHODS OF ANALYSIS
COURSE UNIT: 2
TIME: 2 HOURS
INSTRUCTION: Answer question one and any other two questions.

QUESTION ONE

- 1(ai) What is polarimetry? (2 marks)
- 1(aii) The specific rotation of a solute in a solution can be determined through polarimetry. State the formula and define each term.(6 marks)
- 1(b) Describe monochromator as a component of a spectrometer in relation to its composition and functions (10 marks).
- 1(c) Mention at least 6 applications of fluorimeters and state at least seven precautions that must be taken to use it successfully (12 marks)

QUESTION TWO

- (2a) How does impurity affect the refractive index of a substance? (4 marks).
- 2 (b) Describe the underlying principle of polarimeter (11 mark).
- 2 (c) Describe the relationship between precipitation titration and conductance (5 mark).

QUESTION THREE

- (3ai) Differentiate between ordinary light and plane polarized light (2 marks).
- 3(aii) With the aid of relevant diagrams, illustrate how plane polarized light can be obtained (9 marks)
- 3(b) Describe how the knowledge of conductance can be used to determine the dissociation constant of a weak acid solution (9 marks)

QUESTION FOUR

- 4(a) With relevant illustrations, describe how conductometric titration can be applied to acid-base titration (11 mark)
- 4(b) Briefly describe specific and molar conductance, clearly stating the relationship between them. (9 marks).

QUESTION FIVE

- 5(a) Mention the name of the instrument used for conductivity measurement and briefly describe how it works (12 marks)
- 5(b) Assuming you were given a liquid sample to be analysed for an alkali metal (e.g. potassium), state the name of the instrumental method and the instrument you would use? Give a schematic diagram of the instrument (8 marks)

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