



NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
SEPTEMBER/OCTOBER 2015 EXAMINATION
SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: CHM 422

COURSE TITLE: Natural Products Chemistry II

COURSE UNIT: 2 units

TIME: 2 hours

INSTRUCTION: Answer question 1 (COMPULSORY) and any other three questions.

- (1) (a) List five properties of terpenes. (5 marks)
(b) State five general properties of alkaloids. (5 marks)
(c) Write short notes on the followings:
 - (i) Gas chromatography (3 marks)
 - (ii) Ion-exchange chromatography (3 marks)
 - (iii) Affinity chromatography (3 marks)
 - (iv) High-Performance Liquid chromatography (3 marks)
 - (v) Size-exclusion chromatography (3 marks)
- (2) (a) List five classes of alkaloids based on the heterocyclic ring system they contain. (5 marks)
(b) Describe how you would extract the natural products in a plant tissue by Soxhlet extraction. (10 marks)
- (3) Write short notes on the following classes of terpenes:
 - (a) Diterpenes (3 marks)
 - (b) Sesterpenes (3 marks)
 - (c) Hemiterpenes (3 marks)
 - (d) Sesquiterpenes (3 marks)
 - (e) Monoterpenes (3 marks)
- (4) (a) Describe any five tests for alkaloids. (10 marks)
(b) Highlight the stages involved in the isolation and characterization of natural products. (5 marks)
- (5) (a) List any five spectroscopic/analytical tools for the structural elucidation of natural products. (10 marks)
(b) Outline three main locations of pigments within a cell. (3 marks)
(c) Name the two sub-divisions of adsorption chromatography. (2 marks)
- (6) (a) Explain the following laboratory methods of organic-solvent extraction of compounds:
 - (i) Maceration (2½ marks)
 - (ii) Percolation (2½ marks)
(b) Give two examples each of the following classes of alkaloids:
 - (i) Pyrrolidine-pyridine alkaloids (2 marks)
 - (ii) Piperidine alkaloids (2 marks)
 - (iii) Isoquinoline alkaloids (2 marks)
 - (iv) Indole alkaloids (2 marks)
 - (v) Pyrrolidine alkaloids (2 marks)