



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS**  
**SCHOOL OF SCIENCE AND TECHNOLOGY**  
**MARCH/APRIL 2014 EXAMINATION**

**COURSE CODE: CHM 422**

**COURSE TITLE: NATURAL PRODUCTS CHEMISTRY II.**

**TIME ALLOWED: 2HOURS**

**INSTRUCTION: ANSWER ANY 4 QUESTIONS.**

- (1) Write briefly on the following classes of terpenes.
- (a) Hemiterpenes (3½ marks)
  - (b) Sesquiterpenes (3½ marks)
  - (c) Diterpenes (3½ marks)
  - (d) Monoterpenes (3½ marks)
  - (e) Sesterpenes (4 marks)
- (2) (a) Describe any four tests for alkaloids (3 marks each)
- (b) State any four properties of alkaloids (1½ mark each)
- (3) Write short notes on the following:
- (a) Ion-exchange chromatography (4 marks)
  - (b) Size-exclusion chromatography (3½ marks)
  - (c) Gas chromatography (3½ marks)
  - (d) High-Performance Liquid chromatography (3½ marks)
  - (e) Affinity chromatography (3½ marks)
- (4) (a) List three Laboratory Methods of Organic-Solvent Extraction of Compounds (6 marks)
- (b) Describe how you would extract the natural products in a plant tissue by Soxhlet extraction of chemical compounds using a 1:1 mixture of methylene chloride/methanol (12 marks)
- (5) (a) Classify alkaloids according to the heterocyclic ring system they contain. (12 marks)
- (b) Give a named example of each class of alkaloids mentioned above. (6 marks)

- (6) (a) List any five spectroscopic tools for the structural elucidation of natural products (1½ mark each)
- (b) Highlight the stages involved in the isolation and characterization of natural products (5 marks)
- (c) List five properties of terpenes (5 marks)