



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI - ABUJA.**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF PURE AND APPLIED SCIENCE**  
**FIRST SEMESTER EXAMINATION 2020**

**COURSE CODE:** CHM 422  
**COURSE TITLE:** NATURAL PRODUCTS CHEMISTRY II  
**CREDIT UNIT:** 2  
**TIME:** 2 HOURS  
**INSTRUCTION:** Answer question one and any other three questions.

**QUESTION ONE**

- 1a. Highlight any two milestones in the history of natural products. 4mks
- 1b. Distinguish between primary and secondary metabolite. 3mks
- 1c. Give detailed account of physical properties of terpenes. 4mks
- 1d. Second stage of structural elucidation “structural simplification”. Explain 4mks
- 1e. Provide the common name and one major use of each of the vitamin below:
- (i) Vitamin C is called ascorbic acid 1mk  
Vitamin C is important for the prevention of scurvy 1mk
  - (ii) Vitamin E is called tocopherol 1mk  
Vitamin E is used as antioxidant 1mk
- 1f. Give brief description of three (3) chemical tests for alkaloid. 6mks

**QUESTION TWO**

- 2ai. Explain the term *Alkanoids* 2mks
- 2aii. What are the common features of the compounds referred to as Alkanoids? 3mks
- 2aiii. State the occurrence of alkanoids. 2mks

- 2b. Describe briefly the extraction procedure of alkanoids. 7mks
- 2c. State two physical properties of alkanoids. 1mks

### QUESTION THREE

- 3a. Write short notes on each of the following types of chromatography:
- (i) Affinity chromatography 5mks
  - (ii) High-performance liquid chromatography (HPLC) 3mks
- 3b. Explain the biosynthesis of chlorophyll molecule. 7mks

### QUESTION FOUR

- 4a. Draw the structure of squalene. Mention its terpene class and source. 8 mks
- 4b. Give a detailed explanation of difference between infusion and decoction. 7 mks

### QUESTION FIVE

- 5a. Describe the following laboratory methods of organic-solvent extraction of compounds
- i. Maceration 4mks
  - ii. Percolation 4mks
  - iii. Hot continuous extraction (Soxhlet extraction) 4mks
- 5b. State the importance of the solubility of alkaloids and their salts in pharmaceutical industry. 3mks