NATIONAL OPEN UNIVERSITY OF NIGERIA PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI-ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
2025_2 EXAMINATIONS

COURSE CODE: CHM 422
COURSE TITLE: NATURAL PRODUCTS 2
COURSE UNIT: 2
INSTRUCTION: Answer question one (1) and any other two.
Time: 2 hours

1a. List the five main classes of natural products (5 marks)
b. Define natural Products (2 marks)
c. i. What is the difference between primary and secondary metabolites? (4 marks)
ii. Give two examples each of a primary and secondary metabolite (4 marks)
iii. What is the role of chromatography in natural products research? (2 marks)
d. Give three uses of natural products with relevant examples (9 marks-3 marks each for any 3)
e. Outline the stages involved in the structural elucidation of natural products (4 marks)

2a. Define the terms terpenes and terpenoids. (4 marks)
b. Classify terpenes based on number of isoprene units and give examples for each class (12 marks)
c. State the isoprene rule (4 marks)

3a. List two pharmacological effects of alkaloids and give one example of an alkaloid for each effect. (6 marks)
b. Classify alkaloids based on their chemical structure and give examples for each class. (10 marks)
c. State the therapeutic applications and toxicological aspects of morphine and quinine (4 marks)
4a. Name and briefly describe two biosynthetic pathways for natural products. (4 marks)
b. A pharmacologist discovers a natural from a tropical plant. Outline the steps they would take to determine its structure, assess its biological activity, and evaluate its potential as a drug candidate. (12 marks)
c. What are Specialty or Specialized carbohydrates? Give two examples (4 marks)

5a. Define steroids and outline their basic structure. (4 marks)
b. Discuss the biosynthetic pathway of corticosteroids, starting from cholesterol. Include the key intermediates and enzymes involved. (12 marks)
c. What is the role of the enzyme cytochrome P450 in steroid biosynthesis? (4 marks)