

**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 SCIENCES

JANUARY/FEBRUARY 2018 EXAMINATION

COURSE CODE: CHM 422

COURSE TITLE: NATURAL PRODUCTS CHEMISTRY II

TIME: 2 HOURS

INSTRUCTION: Question one is compulsory. Answer question one and any other three questions.

QUESTION ONE

1ai) State the primary constituents of the essential oils of plants and flowers. 2 marks

1aii) Explain how essential oils can be extracted from plants by steam distillation. 3 marks

1aiii) What is the composition of terpenes. 2 marks

1aiv) State the uses of monoterpenes. 2 marks

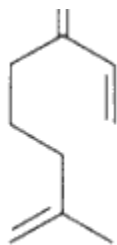
1bi) Differentiate between carotenes and xanthophylls. 3 marks

1bii) Outline the stages of the structural elucidation of natural products. 5 marks

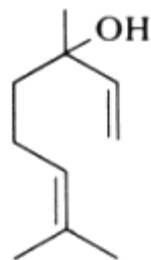
1ci) Why is it necessary to isolate, separate and purify natural products? 2 marks

1cii) Name the following compounds, and state any of their sources and uses.

1d)



II)



6 marks

QUESTION TWO

2a) State the different classes of terpenes and differentiate them. 12 marks

2b) Classify alkaloids based on the heterocyclic ring system they contain in their molecular structure. 3 marks

QUESTION THREE

3a) Discuss the extraction, isolation and characterization of natural products. 10 marks

3aii) Give a brief outline of the biosynthetic pathway of carotenoids. 5 marks

QUESTION FOUR

4a) What are the general methods of extraction of natural products and what would you consider before choosing any of the methods. 6 marks

4b) Give a brief description of steroids. 9 marks

QUESTION FIVE

5ai) Write a short note on carotenoids. 6 marks

5a) List any four spectroscopic/analytical tools for the structural elucidation of natural products.
4 marks.

5b) Differentiate between terpenes and terpenoids. 3 marks

5c) State two importance of Steroids. 2 marks