



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
SEPTEMBER, 2020_1 EXAMINATION

CHM 318 - NATURAL PRODUCT CHEMISTRY I
CREDIT UNIT: 2
TIME ALLOWED 2 HOURS.

INSTRUCTIONS: ANSWER QUESTION 1 AND ANY OTHER 3 QUESTIONS

QUESTION 1

- ai. Discuss and differentiate between terpenes and isoprenoids. **(5 marks)**
- ii Highlight the important of essential oil constituents **(2 marks)**
- b. In tabular form, show the classification of terpenes, their isoprene units and their corresponding number of carbon atoms. **(4 marks)**
- ci). From lanosterol, explain the part ways involve in the synthesis of steroids **(4 marks)**
- d. Use structural composition to qualify alkaloids in to true alkaloids, protoalkaloids, polyamina alkaloids, pseudalkaloids and peptide and cyclopeptide alkaloids. **(5 marks)**
- e. Explain the process of isolating alkaloid using acidic and alkaline solvents. **(5 marks)**

QUESTION 2

- a. What are sex and anabolic steroids? **(4 marks)**
- bi Write on the biological importance of sesquiterpenes; Absciscic acid and Cadalene **(4 mark)**
- bii Give the structure of Absciscic acid **(1 mark)**
- c. There are a few typical reactions involved in the biosynthesis and chemical synthesis of various classes of alkaloids. Using necessary equations and mechanisms, describe in detail the Synthesis of Schiff bases and Mannich reaction **(6 marks)**

QUESTION 3

- a. Gonane is the simplest possible steroid and is composed of seventeen carbon atoms, bonded together to form four fused rings. Using relevant structures, describe this simple steroid. **(7 marks)**
- b. Give four structural examples of terpenes **(8 marks)**

QUESTION 4

- a. Mention any five examples of diterpene substances and their uses. **(5 marks)**
- b. Giving 5 examples in tabular form and state the biological roles of alkaloids in medicine. **(5 marks)**
- c. Draw the structure of any two of the following triterpenoids: Lansterol, Cycloartenol, Cephalosporin and Cyclobuxine. **(5 marks)**

QUESTION 5

- a. What are steroids? Using relevant structure, give its various categories? **(8 marks)**
- b. List any five alkaloids used as psychoactive drugs with their respective function. **(7 marks)**