



NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE
EXPRESS WAY,
JABI - ABUJA.
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
2024_2 EXAMINATION

COURSE CODE: CHM 318
COURSE TITLE: NATURAL PRODUCT CHEMISTRY I
COURSE UNIT: 2
TIME: 2 HOURS
INSTRUCTION: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

Question one score 30 marks with the other two scoring 20 marks each

QUESTION ONE

- (1a) Enumerate the structural classifications of Steroid base on chemical composition and give one example each. (5 marks)
- (1b) i. Draw the structure of cadalene (2 marks)
ii. Draw the structure of Salvinorin A (3 marks)
- (1c) In tabular form, give the class and example of any three true alkaloid (6 marks)
- (1d) i. Identify any three important neurotransmitters in animals that contain alkaloid related substances (3 marks)
ii. Mention the structural precursor of steroids 1 mark, set extra question for 2 marks
- (1e) i. Mention the function of glucocorticoids and mineralocorticoids each (2 marks)
ii. What is the name of the simplest steroids 1 mark, set extra question for 2 marks
iii. Identify the effect of cyclopamine in animals 1mark, set extra question for 2 marks

QUESTION TWO

- (2a) i. Identify the types of alkaloids in (3 marks)
1. Cocaine
 2. Integerrine
 3. Arginine
- ii. What does DMAPP mean? 1 mark, set extra question for 2 marks
- (2b) i. Briefly explain the reason why there is no single method of extracting alkaloid from natural raw materials (1 mark)
- ii. What does GPP mean? (2 marks)
- iii. Vitamin A is an example of which secondary metabolite 1 mark, set extra question for 2 marks
- (2c) i. Describe using diagram the structure of cholesterol (3 marks)
- ii. What do you understand by isoprenylation? (3 marks)
- iii. State the effect of limonene on plants (2 marks)

QUESTION THREE

- (3a) i. Explain protoalkanoids and give one examples (2 marks)
- ii. Give the name of three most typical monocyclic monoterpenes (3 marks)
- iii. What is the other name for acyclic sesquiterpenes (1 mark)
- (3b) i. What are sex steroids? Give any two examples of sex steroids (4 marks)
- ii. State the two uses of nerolidol (2 marks)
- (3c) i. Name the group of diterpenes present in Cannabis (*Cannabis Sativa L.*) and draw the structure of tetrahydrocannabinol (THC) (6 marks)
- ii. State the use of squalene (2 marks)

QUESTION FOUR

- (4a) i. Mention where dehydroleucodine is isolated and give three of its therapeutic properties (5 marks)
- ii. Write the IUPAC name of retene (3 marks)
- (4b) i. Using structure only differentiate between citral A and citral B (4 marks)
- ii. Mention the two uses of cadalene (4 marks)

- (4c) i. Which substance is responsible for the sweet taste of the leave of stevia plant (1 mark)
ii. State the three most important bicyclic monoterpenes (3 marks)

QUESTION FIVE

- (5a) i. Briefly discuss sesterpenes and give examples (4 marks)
ii. Mention two most important acyclic sesquiterpenes (4 marks)
- (5b) i. What are anabolic steroids? (2 marks)
ii. Mention the use of statins (2 marks)
iii. What does DMAPP mean? (2 marks)
- (5c) i. Identify where estrogen, progesterone and testosterone are made (3 marks)
ii. Mention the two uses of cadalene (3 marks)