



NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE
EXPRESS WAY,
JABI - ABUJA.
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
2024 1 EXAMINATION

COURSE CODE: CHM 318
COURSE TITLE: NATURAL PRODUCT CHEMISTRY I
COURSE UNIT: 2
TIME: 2 HOUR
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) i. Identify the constituent of prenylipids (3 marks)
ii. Enumerate the composition of Oleoresin (3 marks)
- (1b) i. In both mevalonic acid pathway and MEP/DOXP pathway biosynthesis of terpenes, what are the ends products? (2 marks)
ii. State four applications of essential oils (4 marks)
- (1c) i. How many isoprene units are in sesquiterpenes? (3 marks)
ii. Identify the number of isoprene units that are in Rubber. (3 marks)
- (1d) i. What are the numbers of Isoprene units found in sesterpenes? (2 marks)
ii. State the roles of Abscisic acid in plants (4 marks)
- (1e) i. State the importance of limonene in agriculture (2 marks)
ii. Name the sesquiterpene dimer that is found in cotton. (2 marks)
iii. Enumerate two medicinal importance of monoterpenes (2 marks)

QUESTION TWO

- (2a) Identify the diterpenoid groups that are physiologically active and give their uses (8 marks)
- (2b) Give any six examples of diterpenes substance (6 marks)

- (2c) i. Explain how squalene epoxide (2,3-oxidosqualene) is produced (2 marks)
ii. State four sources of Nerolidol (4 marks)

QUESTION THREE

- (3a) i. Draw the structure of quinoline (3 marks)
ii. Explain what you understand as gonane (2 marks)
- (3b) i. Enumerate the biological importance of sesquiterpenes (4 marks)
ii. Draw the structure of quinidine (3 marks)
- (3c) i. Describe the core of steroids (4 marks)
ii. What is the name given to the derivatives of putrescine, spermidine and spermine? (2 marks)
iii. Quinolizidine derivatives belong to which group of alkaloids with nitrogen heterocycles? (2 marks)

QUESTION FOUR

- (4a) i. Explain how steroids varies (2 marks)
ii. Identify the type of alkaloids present in Colchicine, Ziziphin, Spermine and Licoctonine (4 marks)
iii. What are pseudalkaloids? (2 marks)
- (4b) i. Mention two steroids that lanosterol can be converted into? (2 marks)
ii. Write down four (4) examples of β -Phenylethylamine derivatives (4 marks)
- (4c) i. How many carbon atoms in cholesterol and testosterone? (4 marks)
ii. Give two examples of peptide alkaloids with 14-membered cycle (2 marks)

QUESTION FIVE

- (5a) Identify the biological precursors of alkaloids and give five examples (8 marks)
- (5b) Name the reactions through which dimeric alkaloids are formed from monomers of the same type (6 marks)
- (5c) i. Explain the biological functions of alkaloid in regard to protection (4 marks)
ii. What class of alkaloids do solanidine and veralkamine belong to? (2 marks)