



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF CHEMISTRY**  
**2022\_1 EXAMINATION**

**COURSE TITLE: NATURAL PRODUCTS CHEMISTRY COURSE CODE: CHM 318**

**TIME ALLOWED: 2 Hours**

**CREDIT: 2 Units**

**INSTRUCTION: Answer Question ONE (1) and any other Two (2) Questions**

**QUESTION ONE**

- a. Give a short description of isoprenoids **[2 Marks]**
- b. Name two main steroids that can be formed from cyclization of triterpene squalene **[2 Marks]**
- c. Show the IUPAC recommended ring lettering and atom numbering of Cholestane skeleton **[13 Marks]**
- d. Define alkaloid and give five rare elements that may be contain in some alkaloids **[8 marka]**
- e. List five major classes of alkaloids **[5 Marks]**

**QUESTION TWO**

Give the structures of the following components of essential oils;

$\beta$ -Pinene, Humulene, Citral A, Citral B and Menthol **[20 Marks]**

**QUESTION THREE**

- a. Using gonane, describe the features of a common steroid **[10 Marks]**
- b. Give the names of classes of terpenes and provide rational for their classification **[10 Marks]**

**QUESTION 4**

- a. Without using structures, describe the following terpenes:  
Monoterpenes and Sesquiterpenes **[10 Marks]**
- b. Base on their structures, list the 5 classes of steroids **[10 Marks]**

**QUESTION FIVE**

- a. Discuss the Steroidogenesis **[6 marks]**
- b. Give a brief report on the natural occurrence of alkaloids **[6 marks]**
- c. You are provided with 200 g of plant sample, use diagram to show how alkaloids can be extracted and isolated using methanol as solvent. **[8 marks]**