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**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS**

**SCHOOL OF SCIENCE AND TECHNOLOGY**

**MARCH/APRIL 2015 EXAMINATION**

 **SCHOOL OF SCIENCE AND TECHNOLOGY**

**COURSE CODE: CHM318**

**COURSE TITLE: Natural Product Chemistry**

**Time: 2 Hours\**

**Instruction Answer any Four Questions**

1. a) i. Define a Steroid. (1 mark)

 ii. Describe and draw the Structure of a Gonane. (3½ marks)

 b) i. Draw the Mevalonate pathway involved in Steroid synthesis. (8 marks)

 ii. Describe the Pathway. (3 marks)

 iii. . Define the following; Terpenes, Terpenoids. (2 marks)

1. a) Draw the structure of the following compounds; α-myrcene, cis-α-ocimene, 4-trans-6- trans-alloocimene. (3 marks)

b) i. Give a detailed elaboration of Diterpenes and list 5 examples of its class. (6½ marks)

 ii. List the 4 groups of Vertebrate steroid and state 2 biological importance of each. (8 marks)

1. a) i. Define Steroidogenesis. (1 mark)

 ii. List the products of Human Steroidogenesis. (2½ marks)

 b) Give 7 detailed elaboration on the importance of Terpenes. (14 marks)

1. a) i. Classify Steroids based on their Taxonomy and give examples of each. (3 marks)

ii. State 2 acyclic representatives of Farsenans, draw the structure of the compound sand give 2 importance of each. (7 marks)

b) i. Describe the Mannich reaction involved in Alkaloid synthesis and show the reaction pathway. (3½ marks)

 ii. Enumerate on 2 applications of Alkaloids with one example in each. (4 marks)

1. a) List 5 mechanisms by which Dimeric Alkaloids are formed, stating one example in each. (5 marks)

ii. Describe the compound Phorbol, stating its biological importance. (2½ marks)

b) In a tabular form, show the main synthesis steps and 2 examples of each of the following alkaloid derivatives; (10 marks)

 i. Tropane derivative

 ii. β-Phenylethylamine derivatives

 iii. Spermidine derivatives

 iv. Purine derivatives

 v. Oxazole derivatives

1. a) i. State 5 properties of Alkaloids. ( 5 marks)

ii. Highlight the 5 major classes of Alkaloid and give one example in each. (7½ marks)

 b) In a tabular form, give the structural classification of steroids based on their chemical composition. ( 5 marks)