

**CHUKA**



**UNIVERSITY**

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**RESIT/ SPECIAL EXAMINATIONS  
THIRD YEAR EXAMINATION FOR THE AWARD OF  
BACHELOR OF SCIENCE BIOCHEMISTRY**

**BIOC 311: PHYTOCHEMISTRY**

**STREAMS: BSC (BIOC) Y3S1**

**TIME: 2 HOURS**

**DAY/DATE: THURSDAY 13/09/2018**

**8.30 AM – 10.30AM**

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**INSTRUCTIONS:**

- i \_\_\_\_\_ Answer Question One and any other Two Questions**
- ii \_\_\_\_\_ Do not write on the question paper**

**Question One (30 marks)**

- a. Write some short notes on sesquiterenes. (5marks)
- b. Illustrate and name the carbons in the structural skeleton of cholesterol involved in steroid biosynthesis. (2mk)
- c. using examples, differentiate between glucocorticoids and mineralocorticoids. (5mks)
- d. cocaine is an alkaloid found in *Erythroxylum* species. Describe its clinical applications. (5mks)
- e. Differentiate between tocopherols and phyloquinones. (4mks)
- f. Differentiate between primary and secondary metabolites. (5 marks)
- g. Using examples, describe the industrial applications of the following compounds:
  - i. Isoflavonoids (1mk)
  - ii. Clomphene (1mk)
  - iii. Flavonoids (1mk)
  - iv. Coumarins (1mk)

**Question 2 (20 marks)**

- a. With the use of a diagram, illustrate the mevalonate and deoxyxylulose pathway, and states its significance (6 marks).
- b. What are terpenoids? Differentiate between the various terpenoids derived from mevalonate and deoxyxylulose pathway. (8marks)
- c. Differentiate between Steroidal saponins and cardiac glycosides. (6mks)

**Question 3**

- a. Using suitable illustrations, describe the various building blocks in secondary metabolites. (8 marks)
- b. Briefly describe the practical applications of alkaloids derived from nicotinic acid.(6mks)
- c. Differentiate between pyrrolidine, piperidine and indoles. (6mks)

**Question 4 (20 marks)**

- a. What are the sources and uses of estrogens and progesterone in reproductive health?  
(10mks)
  - b. Giving examples and sources, describe the major classifications of secondary metabolites  
(10mks)
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