

CHUKA



UNIVERSITY

SUPPLEMENTARY / SPECIAL EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE AWARD OF BACHELOR DEGREE OF
BIOCHEMISTRY**

BIOC 312 : PHYTOCHEMISTRY

STREAMS:

TIME: 2 HOURS

DAY/DATE: MONDAY 16/11/2020

2.30 P.M - 4.30 P.M.

INSTRUCTIONS:

- Answer question **ONE (COMPULSORY)** and any other **TWO** questions.
- Sketch diagrams may be used whenever they may help to illustrate your answer.
- Do not write anything on the question paper.
- This is a closed book exam. **No** reference materials are allowed in the examination room.
- There will be **No** use of mobile phones or any other unauthorized materials.

QUESTION ONE (30 MARKS)

- i. With a use of a suitable diagram, demonstrate the acetate/mevalonate pathway involved in the formation of isopentenyl pyrophosphate, the basic 5 carbon unit of terpenoids biosynthesis (8 marks).
- ii. Discuss different classes of alkaloids according to the heterocyclic ring system they contain (8 marks).

- iii. With a use of suitable diagram, demonstrate the generic structures of major flavonoids (8 marks).
- iv. Some of the common phenolic compounds are phenols, phenolic acids and flavonoids. Draw their structures to demonstrate the different between these secondary metabolites found in plants (6 marks).

QUESTION TWO (20 MARKS)

- i. With a use of a suitable and well labeled diagram, illustrate the anthocyanin biosynthetic pathway in plants (10 marks).
- ii. Using a suitable diagram, illustrate how various secondary metabolites in plants can be derived from the primary metabolites (10 marks).

QUESTION THREE (20 MARKS)

- i. With a use of a suitable diagram, demonstrate the biosynthesis of purine alkaloids theobromine and caffeine (10 marks).
- ii. Discuss the classification of terpenes according to the number of isoprene units (10 marks)

QUESTION FOUR (20 MARKS)

- i. With the use of clear diagram, demonstrate the biosynthesis of isopentenyl pyrophosphate (IPP) and dimethylallyl pyrophosphate (DMAPP) in higher plants cells (8 marks).
 - ii. Demonstrate using a suitable diagram, the biochemical metabolism of phenylpropanoids products in plants (8 marks).
 - iii. Discuss the difference between the primary and secondary plant metabolites (4 marks).
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