



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION
(SCIENCE)
3RD YEAR 2ND SEMESTER 2016/17
MAIN REGULAR

COURSE CODE: SCH 303

COURSE TITLE: NATURAL PRODUCTS CHEMISTRY

EXAM VENUE:

STREAM: (BED SCI.)

DATE:

EXAM SESSION:

TIME: 2:00 HRS

Instructions:

- 1. Answer question 1 (Compulsory) in Section A and ANY other 2 questions in Section B.**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A: ANSWER ALL QUESTIONS (30 MARKS)

QUESTION ONE (30 MARKS)

- a) Differentiate using three examples between secondary and primary metabolites. (6 marks)
- b) State five uses of essential oils/volatiles (5 marks)
- c) Name four common tested and approved phytopharmaceuticals (4 marks)
- d) Limonene is a simplest terpenoid, draw and describe its structural features (4 marks)
- e) With five alkaloid examples define the term psychoactive drugs (6 marks)
- f) Name three acyclic sesquiterpenes, their sources and uses (5 marks)

SECTION B (40 MARKS):

ANSWER ANY TWO QUESTIONS FROM THIS SECTION-EACH QUESTION CARRIES 20 MARKS

QUESTION TWO (20 MARKS)

- a) Explain what you understand by the term phytochemistry (2 marks)
- b) Steroid metabolism is the complete set of chemical reactions that in an organism that produce, modify and consume steroids: Name and briefly describe their three metabolic pathways (9 marks)
- c) Steviol is the aglycone of stevia: give the botanical name of its source, its chemical composition and its important use. (4 marks)
- d) Illustrate using a scheme the biosynthesis of the flavan nucleus (5 marks)

QUESTION THREE (20 MARKS)

- a) In which class of natural products do the following compounds belong? (5 marks)
 - i) Quinine
 - ii) Cholesterol
 - iii) Phelandrene
 - iv) Triacylglycerol
 - v) Caffeine
- b) Outline the extraction procedure for the isolation of alkaloids. (8 marks)
- c) Show how **two** isoprene units are joined through Diel-Alder type of cyclization according to the isoprene rule. (5 marks)
- d) Name two basic amino acids. (2 marks)

QUESTION FOUR (20 MARKS)

- a) Flavonoids are important in the treatment of various diseases. Name four flavonoids and the diseases they treat. (8 marks)
- b) Outline the extraction procedure for the isolation of alkaloids. (8 marks)

c) Name the detecting chemicals used in the analysis of the following phytochemicals. (4 marks)

- i) Alkaloids
- ii) Quinones
- iii) Flavonoids
- iv) Terpenoids

QUESTION FIVE (20 MARKS)

a) Describe the biosynthesis of the following natural products. (15 marks)

- i) Quinine
- ii) Epigallocatechin

b) Briefly define the term phenolics, their biological importance and three ways in which they are characterized. (5 marks)

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