



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BTAC

ACH 4401: MEDICINAL CHEMISTRY 1

SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Dec 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Answer question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- A. Explain the meaning of the following terms as used in medicinal chemistry
- | | |
|--|---------|
| I. Lead compound and Analogue | (2 mks) |
| II. Excipient and state three of its functions | (4 mk) |
| III. Pharmacophore | (1 mk) |
| IV. Prodrug | (1 mk) |
| V. Bioavailability of a drug | (2 mks) |
- B. State four factors that influence the Bioavailability of a drug in the body (4 mks)
- C. Define the law of Mass Action (3mks)
- D. List and discuss the main general factors that affect
- | | |
|---|---------|
| I. Pharmacokinetic phases of drug action | (8 mks) |
| II. Pharmacodynamic phases of drug action | (2 mks) |

Question TWO

- A. Suggest reasons for bacterial resistance to β -lactam drugs (2 mks)
- B. Differentiate between competitive, non-competitive and irreversible inhibition of enzymes (6 mks)
- C. State four characteristics of a good drug (4 mks)
- D. Discuss three Theories of Drug-Receptor Interaction (6 mks)
- E. Explain why water solubility is an important factor in drug design (2 mks)

Question THREE

- A. Explain what drugs are and state four reasons as to why we need new ones (5 mks)
- B. Explain why combination therapy as a treatment of malaria is becoming more common (4 mks)
- C. The artemisinin series (Fig. 1) are the newest of the antimalarial drugs and are structurally unique when compared with the compounds previously and currently used.

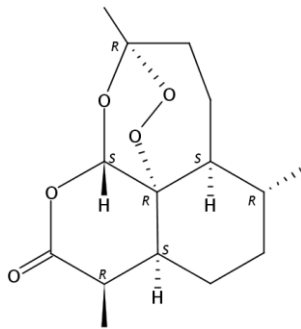


Fig 1: Artemisinin

- I. Name the characteristic key structure that make artemisinin different from other antimalarials (2 mks)
- II. Discuss the mode of action of artemisinin (9 mks)

Question FOUR

- A. Outline by means of suitable examples the significance of
 - I. Structurally rigid groups (3 mks)
 - II. Configuration on the design of new drugs (4 mk)
- B. Drugs are classified in a number of different ways. Name four of these (4 mks)
- C. Outline, using suitable examples, the general modes of action of antiviral drugs (7 mks)
- D. Explain the meaning of the term 'suicide inhibitor' (2 mks)

Question FIVE

- A. Describe the main differences between each of the following:
- i. Fungicidal and Fungistatic drugs (2 mks)
 - ii. agonist and antagonist (2 mks)
 - iii. Eukaryotic and Prokaryotic cells (2 mks)
- B. State the five (5) general factors that need to be considered when designing a drug (5 mks)
- C. Suggest and describe general methods by which the water solubility of a compound could be improved without affecting its type of biological action (6 mks).
- D. Tachyphylaxis arises in people for a variety of reasons. State three of these reasons (3 mks)