

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE**

**BIOC 222: XENOBIOTIC METABOLISM AND DRUG DEVELOPMENT**

**STREAMS: BSC BIOC**

**TIME: 2 HOURS**

**DAY/DATE: MONDAY 08/04/2024**

**2.30 P.M – 4.30 P.M.**

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**INSTRUCTIONS:**

- Answer question ONE and any OTHER TWO questions.

**QUESTION 1 (COMPULSORY) (30 MARKS)**

- (a) Explain the significance of drug patents. (6 marks)
- (b) Highlight FOUR factors that influence the rate of toxicant distribution in the body. (4marks)
- (c) Briefly describe the application of environmental and occupation toxicology. (6 marks)
- (d) Identify any SIX factors influencing the difference in response to a xenobiotic in a population (individual susceptibility). (6 marks)
- (e) (i) Define a toxin and give two examples. (2 marks)
- (ii) Differentiate between a mutagen and a teratogen. (2 marks)
- (f) Explain any FOUR factors that affect membrane transport of xenobiotics. (4 marks)

**QUESTION 2 (20 MARKS)**

- (a) Using antihypertensive drugs that target rennin-angiotensin system as an example, explain the contribution of scientific knowledge to drug discovery. (10 marks)
- (b) Structurally explain the main reactions of organophosphates in the human body. (10 marks)

**QUESTION 3 (20 MARKS)**

- (a) Discuss the beneficial applications of toxins, and in each case, provide an example of a specific toxin and its application. (10 marks)
- (b) The role of phase II conjugation reactions is to increase the polarity of xenobiotic for easier excretion. Describe any five conjugation reactions involved in xenobiotic metabolism. (10 marks)

**QUESTION 4 (20 MARKS)**

- (a) Giving specific examples, explain FIVE possible outcomes of xenobiotics following biotransformation. (10 marks)
- (b) Describe, in detail, the pathways through which human beings get exposed to xenobiotics. (10 marks)
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