

CHUKA



UNIVERSITY

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

BIOC 222: XENOBIOTIC METABOLISM AND DRUG DEVELOPMENT

STREAMS: BSC BIOC

TIME: 2 HOURS

DAY/DATE: MONDAY 05/07/2021

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS:

- *Answer question **one** and **any other two** questions*

Questions

Question 1 (Compulsory) (30 marks)

- Describe briefly the significance of biotransformation of xenobiotics. (5 marks)
- Highlight 5 factors that influence the difference in response to a xenobiotic in a population (individual susceptibility). (5 marks)
- Briefly describe 3 major hurdles in the drug discovery and development faced in the present day. (6 marks)
- Explain with examples the difference between a toxin and a toxicant. (4 Marks)
- Outline 5 factors that influence absorption of a toxicant in man. (5 marks)
- Explain the applications of knowledge of toxicology in clinical and food industry. (5 marks)

Question 2 (20 marks)

- The role of phase II conjugation reactions is to increase the polarity of xenobiotics for easier excretion. Describe any 5 conjugation reactions involved in xenobiotic metabolism. (10 marks)
- Explain the stages of clinical trials for a new drug molecule. (10 marks)

Question 3 (20 marks)

- a) Define toxicodynamics. (1 mark)
- b) Using a suitable diagram, describe reaction types between a toxicant and target molecule, and indicate possible outcomes of this interaction. (9 marks)
- c) By use of a well labeled monotonic dose response curve, describe NOAEL, LOAEL, ED50, LD50 and potency. (10 marks)

Question 4 (20 marks)

- a) Describe in detail how human beings get exposed to xenobiotics. (10 marks)
 - a) Discuss processes of membrane transport of xenobiotics. (10 marks)
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