CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY

BIOC 222: XENOBIOTIC METABOLISM AND DRUG DEVELOPMENT

STREAMS: B.Sc BIOC Y2S2 **TIME: 2 HOURS**

DAY/DATE: MONDAY 9/04/2018 **11.30 A.M - 1.30 P.M.**

INSTRUCTIONS:

- **Answer Question ONE and any other TWO Questions.**
- **Do not write anything on the question paper.**

QUESTION ONE

(a) Distinguish between the following biochemical terms in respect to xenobiotics and drug metabolism; [4 Marks]

(i) Cilucuromidatia vs sulfation

(ii) Pharmacokinetics vs Pharmacodynamics

(b) Oxidation is one of the Phase I reactions that often occur to xenobiotic once it enters the cell. Explain and give an example to illustrate the reaction. [5 Marks]

(c) Using specific/appropriate example, explain phase II reactios of xenobiotic biotransformation. [6 Marks]

(d) Explain the mercapturic acid pathways as an example of phase three reaction involved in the excreton of the xenobiotics from the cell. [6 Marks]

(e) Explain five possible functional effects of drug metabolism giving specific types of drug involved. [5 Marks]

(f) Describe the role of cytochrome P450 in xenobiotic metabolism highlighting its pros and cons. [4 Marks]

QUESTION TWO

(a) Give five mechanisms involved in drug toxicity. Discuss giving an illustration the type of toxicity associated with acetaminophen drug. [10 Marks]

(b) Discuss organ and tissue toxicity under the following subheading; [10 Marks]
   (i) Carcinogenesis
   (ii) Teratogenesis

QUESTION THREE

Discuss the conventional approaches to drug discovery citing classical examples where appropriate under the following subheading; [20 Marks]
   (i) Traditional knowledge approach
   (ii) Discovery through serendipity
   (iii) Discovery through metabolomics
   (iv) Discovery through In silico screening
   (v) Preclinical trials

QUESTION FOUR

The safety or efficacy of a drug must be thoroughly understood before the drug is administered to any group of individuals. Therefore regulations governing clinical trials are developed to assure safety and efficacy of new medications. Discuss the clinical trials involved under the following sub-heading; [20 Marks]
   (i) Phase I clinical trials
   (ii) Phase II clinical trials
   (iii) Phase III clinical trials
   (iv) Phase IV clinical trials

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