JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

UNIVERSITY EXAMINATION 2022/2023

MSC, MEDICINAL CHEMISTRY

SECOND SEMESTER SUPPLEMENTARY EXAMINATION

TPS 3109: PHARMACOLOGY AND TOXICOLOGY

DATE: DECEMBER 2023   TIME: THREE HOURS

Instructions : Answer any FOUR of the SIX questions

1. Discuss pan-assay interference compounds and structural alerts as relates to their impact in progressing medicinal chemistry programs of drug discovery projects.   (25 marks)

2. Describe the various applications of artificial intelligence and machine learning in modern pharmaceutical research and development.   (25 marks)

3. Extensive chronic toxicity studies are required before a clinical development candidate is selected. Discuss the application of animal models for such toxicity studies. (25 marks)

4. During drug discovery, it is important that the project teams bear in mind the ultimate route of drug administration and drug target to be able to execute appropriate medicinal chemistry optimizations. Refer to suitable examples to elaborate on this statement.

(25 marks)

5. We frequently presume proportional dose-response relationship for drugs. This, however, does not always hold true. Discuss the factors responsible for atypical pharmacodynamics and the implication that this has when driving drug discovery projects.   (25 marks)

6. Despite extensive preclinical and computational studies, there remains a risk of lack of translation of the observed pharmacological and toxicological profiles when a drug is approved for clinical use. Explain possible cause for this observation, supporting your assertions with relevant examples.   (25 marks)