WI-2-60-1-6

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

UNIVERSITY EXAMINATIONS 2024/2025

2024-2025 DRAFT MAIN EXAMINATION FOR MASTERS IN EPIDEMIOLOGY

FIRST YEAR SECOND SEMESTER

PEH 3108: MOLECULAR EPIDEMIOLOGY

DATE: DECEMBER 2024

TIME: 3 HOURS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

1. **Explain the molecular techniques applied in molecular epidemiology in the identification of disease pathogens.**
   a. **DNA sequencing (5marks)**
   b. **RNA sequencing (5 marks)**
   c. **Microarray analysis (5 marks)**
   d. **Restriction mapping (5 marks)**
   e. **Western blotting (5 marks)**
2. **Describe how the following mutations impact the functions of proteins.**
   a. **substitution (5 marks)**
   b. **deletion (5 marks)**
   c. **insertion (5 marks)**
   d. **inversion (5marks)**
   e. **frameshift mutation (5marks)**
3. **Differentiate between family-based and population-based study designs employed in molecular epidemiology, citing relevant examples. (25 marks)**
4. **Discuss genetic screening as a molecular epidemiological application in the study of inheritable diseases. (25 marks)**
5. **An outbreak of diarrheal infection has been reported by a subcounty hospital. It has been found that none of the cases are responding to the available antibiotics recommended for treatment. As a molecular epidemiologist discuss how you are going to identify the cause of this infection to inform research into a new working intervention. (25 marks)**
6. **Using molecular techniques discuss how you can be able to identify the cause of lung cancer in patients who have been consistently exposed to asbestos and have a history of tobacco smoking. (25 marks)**

END.