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(*University of Choice*)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

(MAIN CAMPUS)
UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

MAIN EXAM
FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN EPIDEMIOLOGY AND BIOSTATISTICS

COURSE CODE: HEM 223

COURSE TITLE: MOLECULAR EPEDIMIOLOGY

DATE: 20/04/2022 **TIME: 8.00-10.00 AM**

INSTRUCTIONS TO CANDIDATES

This paper is divided into two sections, A and B respectively: Short Answer Questions (SAQs) and Long Answer Questions (LAQs). Answer all questions

TIME: 2 Hours

This Paper Consists of 2 Printed Pages. Please Turn Over

SECTION A (40 MARKS) ANSWER ALL QUESTIONS

1. State **FIVE** types of biomarker systems (5 Marks)

2. Outline any **FIVE** principles of Hardy-Weinberg (5 marks)

3. Outline key steps involved in Northern blotting technique (5 Marks)

4. Tabulate the genotype frequencies of the following mutants that causes drug resistance in plasmodium vivax given homozygous [TT], heterozygous [Tt] and rear homozygous [**tt**] in the four study populations (5 Marks)

Study populations	**TT**	**Tt**	**tt**	**Genotype frequencies %**
Lurambi	**12**	**3**	**22**	
Joyland	**4**	**1**	**17**	
Maraba	**3**	**6**	**72**	
Sichirai	**11**	**9**	**23**	
Tea zone	**31**	**8**	**64**	

5. State **FIVE** important factors to be considered when choosing a marker system (5 Marks)

6. Briefly explain the advantages and disadvantages of RFLP as a biomarkers (5 Marks)

7. Explain the working principles of a polymerase chain reaction (PCR) (5 Marks)

8. Outline FIVE aims of a molecular epidemiological study (5 Marks)

SECTION B (30 MARKS) ANSWER ANY TWO QUESTIONS

1. Discuss ethical issues in molecular epidemiology studies (15 Marks)
2. Discuss the lifecycle in bio specimens in biological bio resources centers (15 Marks)
3. Analyze key considerations required in sample collection, processing and data management during molecular epidemiology studies (15 Marks)