



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

FIRST YEAR SECOND SEMESTER EXAMINATIONS

**FOR THE DEGREE
OF
MASTERS OF SCIENCE IN MEDICAL MICROBIOLOGY**

COURSE CODE: BMM 824

COURSE TITLE: MOLECULAR DIAGNOSTIC AND SYNTHETICS

DATE: 28/04/2022

TIME: 8.00 - 11.00 AM

Instructions

Answer Question 1 and ANY OTHER 3 Questions

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

1. A gene is a section of DNA made up of a sequence of As, Cs, Ts and Gs. Explain typical functional structure of prokaryotic genes (25 marks).
2. The world is facing increasingly difficult challenges today, population growth resulting in the growing demand for critical resources such as energy, clean water, food and medicine are taxing our fragile planet. To fulfill these needs we need to exploit technologies. How has the use genomic technology offer the world viable and sustainable alternatives? (25 marks)
3. Sequence analysis is the process of subjecting a DNA, RNA or Peptide sequence to any of a wide range of analytical methods to understand its features, function, structure or evolution. Discuss practical application of sequence analysis in life (25 marks)
4. A set of techniques has been adopted for gene cloning for particular purpose(s). Explain the common strategies used genes cloning (25 marks)
5. CRISPR-Cas9 protein has been used in biotechnology engineering for gene editing. Explain conditions where CRISPR-Cas9 system has been implicated (25 marks)
6. Directed evolution is technique used in protein engineering that resemble process of natural selection to evolve proteins or Nucleic acid towards user defined goal. There two natural evolutionary processes which has been adapted for directed evolution process, gene recombination and random mutagenesis. Explain the homologous recombination methods (25 marks)