



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN MOLECULAR BIOLOGY AND

FORENSIC TECHNOLOGY

AFR 4402: FORENSIC MOLECULAR BIOLOGY EXAM II

END OF SEMESTER EXAMINATION

SERIES: JULY 2025

TIME: 2 HOURS

DATE: Pick Date JULY 2025

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- (a) Describe the organization of a gene (4 Marks)
- (b) Highlight the advantages for STR markers (6 Marks)
- (c) Outline the advantages of molecular markers in forensic investigation (5 Marks)
- (d) Highlight the applications for DNA testing (5 Marks)
- (e) Describe base pairing in DNA structure (5 Marks)
- (f) Highlight differences between human nuclear genome and mitochondrial genome (5 Marks)

Question TWO

- a) Outline the currently used markers in forensic DNA testing (10 Marks)
- b) Explain the information one can get from forensic DNA testing (10 Marks)

Question THREE

- (a) Explain **THREE** (3) issues arising from forensic DNA testing (6 Marks)
- (b) Describe the interpretation of the **THREE** (3) types of conclusions based on issues arising from DNA testing (14 Marks)

Question FOUR

Describe the characteristics of the various repetitive DNA sequences (20 Marks)

Question FIVE

- (a) Describe mtDNA and Y-STR as linkage markers available in forensic DNA testing explaining how they differ from combined DNA index system (CODIS) STR (12 Marks)
- (b) Describe the composition of Y-STR and combined DNA index system (CODIS) data bases (8 Marks)