

LAIKIPIA



UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

FOURTH YEAR EXAMINATION FOR THE DEGREE
BACHELOR OF SCIENCE IN BIOCHEMISTRY

**BIOC 423: STEM CELL AND APPLIED MOLECULAR
TECHNOLOGY**

STREAM: BIOCHEMISTRY

TIME: 2 HRS

DAY: TUESDAY[2.30P.M – 4.30P.M]

DATE: 16/04/2024

THIS QUESTION PAPER CONSISTS OF THREE (2) PAGES

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INSTRUCTIONS

Answer all questions in section A and only one in section B

SECTION A : ANSWER ALL QUESTIONS (50 MARKS)**QUESTION ONE**

- a) List **four** key proteins required for the reprogramming of mammalian somatic cells to iPSCs (2 Marks)
- b) Using examples state four uses of miRNAs (4 Marks)
- c) Describe the cloning procedure used to generate Dolly Sheep (4 Marks)

QUESTION TWO

- a) Describe a molecular marker that is used to unambiguously identify the gender of human specimens (5 Marks)
- b) Outline the algorithms used to construct phylogenetic tree (5 Marks)

QUESTION THREE

Describe experimental strategy that can be used to:

- a) Identify operator sequences using a known repressor (5 Marks)
- b) Assess a direct effect of a given protein on its target mRNA (5 Marks)

QUESTION FOUR

Explain how gene editing is done using the CRISPR/Cas9 system (10 Marks)

QUESTION FIVE

Using an example explain how the Terminator technology work (10 Marks)

SECTION B: ANSWER ONLY ONE QUESTION (20 MARKS)**QUESTION SIX**

Citing examples discuss the use of molecular techniques in medicine (20 Marks)

QUESTION SEVEN

Describe in details the various markers that can be used for molecular analyses (20 Marks)

