



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

**SCHOOL OF PURE AND APPLIED SCIENCES
DEPARTMENT OF BIOLOGICAL SCIENCES
FOURTH YEAR SUPPLEMENTARY/SPECIAL EXAMINATION FOR DEGREE IN
BACHELOR OF SCIENCE IN PUBLIC HEALTH**

HPH 310: BIOTECHNOLOGY AND HEALTH

DATE: 10/3/ 2023

TIME: 2.00 – 4.00 PM

INSTRUCTIONS

1. Answer Question 1 (compulsory) and any two questions
2. Use clean well labelled diagrams wherever appropriate.

QUESTION ONE (30 MARKS)

- a) Summarise the production of transgenic fish in three points (3 marks)
- b) Describe any three Ribose based nucleic acids (3marks)
- c) With illustration describe the role of EcoR1 (3 marks)
- d) Describe composite transposons (3 marks)
- e) Step by step highlight the basic steps in gene cloning (3 marks)
- f) Give the implication of Integration of an IS element in a gene (3 marks)
- g) Outline the importance of Ori gene in plasmids (3marks)
- h) Describe the role of enzyme primase during somatic cell division (3 marks)
- i) Outline three types of cloning (3 marks)
- j) Describe the feature of Cre-loxP that makes them suitable in cloning genes (3 marks)

QUESTIONS TWO (20 MARKS)

Discuss the role of transgenic mice and Cattle and their applications in biotechnology (20 marks)

QUESTIONS THREE (20 MARKS)

Illustrate gene therapy and its applications in medical biotechnology (20 marks)

QUESTION FOUR (20 MARKS)

Discuss how *Agrobacterium tumefaciens* can be applied in production of medicine (20 marks)

QUESTION FIVE (20 MARKS)

Discuss how you can use cDNA libraries in gene sequencing (20 marks)