



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

BACHELOR OF EDUCATION SCIENCE

AND AGRICULTURAL EDUCATION

SBT 412: APPLIED MICROBIOLOGY

**DATE: 17/3/2022**

**TIME : 8:30 – 10:30 AM**

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## Instructions

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

## SECTION A

### QUESTION ONE (30 MARKS)

- a) Outline three mechanisms of vaccine production (3 marks)
- b) Explain the mode of action of antimicrobial agents on the cell wall (3 marks)
- c) Explain three advantages of live vaccines (3 marks)
- d) Illustrate three advantageous traits of plants resulting from genetic modification (3 marks)
- e) Explain the role of a specific microorganism in yogurt production (3 marks)
- f) By use of a chemical equation describe the role of *Saccharomyces cerevisiae* in bread making. (3 marks)
- g) Explain the factors to consider when choosing an antimicrobial agent (3 marks)
- h) Explain the role of radiation as an agent preservation (3 marks)
- i) Distinguish between Gram negative and Gram positive cells (3 marks)
- j) Refrigeration is not a method of decontamination. Explain (3 marks)

## **QUESTION TWO**

- a) Illustrate the typical genetic modification procedure (10 Marks)
- b) Discuss the development of transgenic variety of wheat by the use of the *Agrobacterium* mediated gene transfer (10 marks)

## **QUESTION THREE**

Compare and contrast the process of beer making and wine making . (20 marks)

## **QUESTION FOUR**

- a) Describe the role of microorganisms in the nitrogen cycle (10 marks)
- b) Describe the chemical methods of microbial decontamination (10 marks)

## **QUESTION FIVE**

Discuss the process of industrial waste water treatment (20 marks)