



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION (SCIENCE)

SBT 202: GENERAL MICROBIOLOGY

DATE: 17/12/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

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

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Illustrate an experiment to negate the abiogenesis theory. (3 marks)
- b) Describe the concept of replication in Edward Jenner's experiment. (3 marks)
- c) An emergent microbe is believed to cause disease X, describe the protocol of confirming that disease X is caused by the new microbe. (3 marks)
- d) Describe the non-motility appendages of bacteria. (3 marks)
- e) What is the significance of peptidoglycan in Gram staining? (3 marks)
- f) Describe the protocol of obtaining a pure culture from a mixed culture of bacteria. (3 marks)
- g) Describe the process of preparing nutrient agar for growth of bacterial colonies. (3 marks)
- h) Describe with an illustration how the pour plate method results in bacterial dilution. (3 marks)
- i) After ten dilutions of a blood sample, a lab technologist cultured 0.01ml of the diluted sample on a general purpose media and observed 150 colonies. Calculate the CFUs. (3 marks)
- j) Describe sterilization by the autoclave. (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 MARKS)

- a) Discuss the significance of Gram staining protocol in bacteriology (10 marks)
- b) Discuss the microbiological techniques (10 marks)

QUESTION THREE (20 MARKS)

Discuss bacterial virulence factors.

QUESTION FOUR (20 MARKS)

Discuss the working of specified antimicrobial agents on the bacterial cell.

QUESTION FIVE (20 MARKS)

- a) Discuss the three categories of media with two illustrations in each case. (12 marks)
- b) Describe the shapes of bacteria and their possible variants (8 marks)