



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENTION)

SBT 412: APPLIED MICROBIOLOGY

DATE: 30/4/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS

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

SECTION A

QUESTION ONE (30 MARKS)

- a) Explain three areas of study in microbiology (3 marks)
- b) Outline factors that determine effectiveness of antimicrobial agents (3 marks)
- c) Describe sterilization by use of steam under pressure (3 marks)
- d) Distinguish between the following terms
 - i. Isolation and Inoculation (2 marks)
 - ii. Sterilization and disinfection (2 marks)
- e) Illustrate how you would obtain a pure culture of bacteria "B" from a contaminated water sample. (4 marks)
- f) differentiate between gram positive and gram negative bacteria (3 marks)
- g) Explain how the temperature of steam can be raised above 100°C? (3 marks)
- h) Outline three characteristics of biogeochemical cycles (3 marks)
- i) Explain the mode of action of the following agents of microbial control

- i. Low temperatures (2 marks)
- ii. Pasteurization (2 marks)

SECTION B

QUESTION TWO (20 MARKS)

- a) Describe the distinctive characteristics of coliforms (5 marks)
- b) Discuss the three steps applicable in assessing water quality (15 marks)

QUESTION THREE (20 MARKS)

- a) Discuss the modes of action of antimicrobial agents (12 marks)
- b) Describe FOUR economically important microorganisms isolated from extreme environments. (8 marks)

QUESTION FOUR (20 MARKS)

- a) Evaluate the importance of soil microorganisms in the nitrogen cycle. (15 marks)
- b) Discuss eutrophication and its effects. (5 marks)

QUESTION FIVE (20 MARKS)

Discuss five industrial applications of microorganisms