



MACHAKOS UNIVERSITY

University Examinations 2019/2020 academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

SBT 412: APPLIED MICROBIOLOGY

DATE: 21/1/2021

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.

QUESTION ONE (30 MARKS)

- a) Explain the **three** steps involved in detection of pathogenic microbes in water. (3 marks)
- b) Describe the production of live attenuated vaccines. (3 marks)
- c) Highlight **three** characteristics of ideal microorganisms used in the production of microbial biomass. (3 marks)
- d) Describe how the fecal indicator test performed. (3 marks)
- e) Explain **one** application of biosurfactants. (3 marks)
- f) Explain **three** roles of fermentation in food industry. (3 marks)
- g) Highlight **three** advantages of bioleaching. (3 marks)
- h) Name **three** indicator microbes for heavy metal pollution. (3 marks)
- i) Explain **three** reasons why organic compounds are more effectively degraded in an environment containing microbial community than in a pure culture of a single organism. (3 marks)
- j) List down **three** advantages of using *Zymomonas mobilis* over *Saccharomyces cerevisiae* in industrial ethanol production. (3 marks)

SECTION B

QUESTION TWO (20 MARKS)

Discuss the biological nitrogen fixation.

QUESTION THREE (20 MARKS)

Explain various methods used in prevention and control of microbial contamination for pharmaceutical products.

QUESTION FOUR (20 MARKS)

Discuss the waste water treatment process.

QUESTION FIVE (20 MARKS)

- a) Explain **two** strategies utilized by microbiologists to improve the properties of microbial enzymes. (10 marks)
- b) Discuss the cheese making process. (10 marks)