



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR FIRST SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN ENVIROMENTAL SCIENCES

ENS 132: ENVIRONMENTAL MICROBIOLOGY

DATE:

TIME :

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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 1

- i. Outline the three classes of fungi based on morphology (3 marks)
- ii. Briefly, describe the biotic stresses in soil (3 marks)
- iii. Give a brief account of antibiotics (3 marks)
- iv. Distinguish between mutualism and parasitism (3 marks)
- v. Describe the exponential phase of microbial growth (3 marks)
- vi. Distinguish between neustonic and endolithic algae (3 marks)
- vii. Outline the industrial signifance of yeasts (3 marks)
- viii. Distinguish between chemoheterotrophs and photoautotrophs (3 marks)
- ix. Describe the role of filtration in controlling airborne transmission (3 marks)
- x. Explain bacterial metabolism during aerobic and anaerobic conditions (3 marks)

## SECTION B

### QUESTION 2

Discuss the characteristics of bacterial growth phases for batch culture and environmental systems (20 Marks)

**QUESTION 3**

- a) Describe the fermentation process for the production of alcohol (10 marks)
- b) Discuss the factors that influence the distribution of microbes in soil (10 marks)

**QUESTION 4**

- a) Explain the distinction between prokaryotes and eukaryotes (8 marks).
- b) Explain major factors that promote the survival of microbes in aerosols (12 marks)

**QUESTION 5**

- a) Discuss the structure and function of a prokaryotic cell envelope (10 marks)
- b) Describe aero-microbiological pathway (10 marks)