

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF BACHELOR OF EDUCATION (SCIENCE)
AND BACHELOR OF SCIENCE

BOTA 220: MICROBIAL ECOLOGY

STREAMS: BSC

TIME: 2 HOURS

DAY/DATE: TUESDAY 17/12/2024

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS:

- Answer all questions in section A and any **two** in section B
- Do not write anything on the question paper
- Use illustrations where appropriate to enhance your answer.

Section A (30 marks)

1. a) Define the following terms as applied in microbial ecology. [3 marks]
 - i. Coliforms
 - ii. Indirect viable count
 - iii. Syntrophism
- b) Classify bacteria based on their optimal growth temperature. [2 marks]
2. Outline criteria for selecting a good bacterial indicator of fecal pollution. [5 marks]
3. Using illustration, describe standard plate count. [5 marks]
4. Discuss the importance of nitrogen cycle. [5 marks]
5. a) Describe how a microbial biofilm is formed. [2 mark]
- b) Discuss the advantages of biofilm formation in bacteria. [3 marks]
6. a) Explain the importance of microbial interactions. [2 marks]
- b) Microorganisms evolve and adapt to polluted environment. Justify this statement. [3 marks]

Section B (40 marks)

7. a) Describe mechanism of ecological succession. [14 marks]

BOTA 220

- b) Explain six characteristics of bacteria in exponential growth phase. [6 marks]
8. a) Discuss different types of culture media for bacteria based on application. [12 marks]
- b) Discuss reasons why xenobiotics are difficult to degrade using microorganisms. [8 marks]
9. a) Explain how to control microbial growth in the laboratory. [10 marks]
- b) Describe diseases caused by airborne viruses. [10 marks]
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