



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (ENVIRONMENTAL SCIENCES)

ENS 132: ENVIRONMENTAL MICROBIOLOGY

DATE: 26/8/2022

TIME: 11.00-1.00 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)

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|----|---|-----------|
| a) | Explain significance of rhizobia | (3 marks) |
| b) | Explain commensalism in microorganisms | (3 marks) |
| c) | Explain the role of a bacterial plasmid | (3 marks) |
| d) | Describe the formation of bioaerosols | (3 marks) |
| e) | Describe the stationary phase of microbial growth | (3 marks) |
| f) | Outline the general characteristics of viruses | (3 marks) |
| g) | Describe the significance of bioremediation | (3 marks) |
| h) | Describe extremophiles | (3 marks) |
| i) | Describe the significance of launching in aeromicrobiological pathway | (3 marks) |
| j) | Explain the influence of microbes on meteorological processes | (3 marks) |

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

QUESTION TWO (20 MARKS)

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|----|--|------------|
| a) | Discuss ways in which environmental microbiology influences human life | (5 marks) |
| b) | Discuss the mechanisms bacteria use to acquire new DNA from the environment. | (15 marks) |

QUESTION THREE (20 MARKS)

- a) Discuss various abiotic stresses that microbes encounter in soil (10 marks)
- b) Discuss the possible modes of respiratory transmission of Covid-19 (10 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the role of microbes in the treatment of sewage water systems (10 marks)
- b) Discuss the classification of microbial interactions (10 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss various ways to control airborne transmission of pathogenic microbes (12 marks)
- b) Describe biogeochemical cycle (8 marks)