



MACHAKOS UNIVERSITY

University Examinations 2021/2022

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF PHYSICAL SCIENCES

FOURTH YEAR SUPPLEMENTARY EXAMINATION FOR
BACHELOR OF SCIENCE IN BIOLOGY

SBT 412: APPLICATION OF MICROBIOLOGY

DATE:

TIME :

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. Describe the significant of the extremophile nature of micro-organisms (3 marks)
- ii. Outline the three benefits of microbes in the process of nutrient cycling (3 marks)
- iii. List the three factors that determine the composition and distribution of digestion menagerie (3 marks)
- iv. Describe briefly the process of the fermentation (3 marks)
- v. Explain the Concept of Biostimulation
- vi. Differentiate between probiotic and prebiotic (3 marks)
- vii. Describe why the naturally occurring bacteria are not sufficient in treating organically polluted aquatic ecosystems (3 marks)
- viii. List the three (3) advantages of the application of the Bioremediation technology (3 marks)
- ix. Discuss why the bioremediation technique is highly preferred when treating organic pollutants (3 marks)
- x. Describe factors that determine microbial interactions between surface and underground waters (3 marks)

SECTION B

Question 2

- a. Describe the process of the nitrogen cycle (10 Marks)
- b. Using examples, explain the concept of bioremediation (10 Marks)

Question 3

- a. Describe how you can solve the water crisis in Machakos County through groundwater management (10 Marks)
- b. Describe the utilization of microorganisms as bioindicators (10 Marks)

Question 4

As an environmental officer in charge of waste water treatment department, describe the process of sewage treatment (20 Marks)