

CHUKA

UNIVERSITY



UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF BOTANY

BOTA 337: MICROBIAL PHYSIOLOGY

STREAMS: BSC. BOTANY

TIME: 2 HOURS

DAY/DATE: MONDAY 14/04/2025

8.30 A.M. – 10.30 A.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) Differentiate between the following terms: [4 marks]
 - i. Oxidoreductases and Transferases.
 - ii. Apoenzyme and Holoenzyme.
- b) Explain the role of enzymes in microbial metabolism. [1 mark]
2. Highlight the differences between aerobic and anaerobic respiration in microorganisms. [5 marks]
3. Explain the mechanisms employed by microorganisms to uptake nutrients. [5 marks]
4. a) Describe the role of ATP in microbial metabolism. [1 mark]
- b) Outline the significance of the TCA cycle in microbial energy production. [4 marks]
5. Explain the importance of glycolysis. [5 marks]
6. a) Explain the role of electron transport chains in microbial metabolism. [1 mark]
- b) Discuss the significance of microbial fermentation in industrial applications. [4 marks]

Section B (40 Marks)

7. Discuss the different strategies used by microorganisms to adapt to extreme environmental conditions. [20 marks]
8. a) Discuss pathway for glucose breakdown to form pyruvate in bacteria. [10 marks]
b) Discuss the mechanisms microorganisms employ to respond to environmental stress. [10 marks]
9. a) Explain the process of denitrification and its significance in microbial ecosystems. [5 marks]
b) Describe the different types of microbial photophosphorylation and their significance. [15 marks]
-