

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE

BIOC 334: INDUSTRIAL BIOCHEMISTRY

STREAMS: BSC

TIME: 2 HOURS

DAY/DATE: FRIDAY 01/09/2023

2.30 P.M – 4.30 P.M.

INSTRUCTIONS

- (i) Answer All the Questions**
- (ii) Do not write on the question paper**

QUESTION ONE: (30 Marks)

- (a)(i) Briefly describe five types of phytoremediation techniques. (5 Marks)
- (ii) Discuss the role of microorganism in sewage treatment process. (7 Marks)
- (b) Outline microbial production of yogurt. (7 marks)
- (c) List and describe fundamental benefits of fermented milk in human body. (4 marks)
- (d) Microbial cultures can be used to produce **aroma** compounds, either specifically for application as food additives or *in situ* as a part of food fermentation processes. Using specific examples, discuss this statement. (7 marks)

QUESTION TWO:(20 Marks)

- (a) What are some of the pre-requisites for using microorganisms to manufacture a product? (3Marks)
- (b) Distinguish between penicillin and cephalosporin antibiotics. (2 Marks)
- (c) Describe microbial production of β -lactam antibiotics. (10 Marks)

- (d) Artemisinin is a leading antimalarial today and is obtained from extracts of the Wormwood tree, *Artemisia annua*. Explain how genetically-engineered strain of *S. cerevisiae* have been used to improve production of Artemisinin. (5 Marks)

QUESTION THREE:(20 Marks)

- a. Define co-metabolism and explain why it is important for biodegradation? (10 Marks)
- b. Explain the use of microbial enzymes in industry. (10Marks)
