

CHUKA



UNIVERSITY

## UNIVERSITY EXAMINATIONS

### EXAMINATION FOR THE AWARD OF BACHELORS DEGREE IN MICROBIOLOGY AND BIOTECHNOLOGY

#### BOTA 103: METHODS AND INSTRUMENTATION IN MICROBIOLOGY AND BIOTECHNOLOGY

#### STREAMS: B.SC MICROBIOLOGY AND BIOTECHNOLOGY

**DAY/DATE:**

**TIME: 2 HOURS**

#### INSTRUCTIONS:

- DO NOT WRITE ON THE QUESTION PAPER
- Answer ALL questions in **Section A** (30 marks).
- Answer **TWO** questions in **Section B** (40 marks).

#### SECTION A: (30 MARKS)

1. Define the following terms as used in microbiology: (5 Marks)
  - a) Inoculum
  - b) Pure culture
  - c) Chromophore
  - d) Autoradiography
  - e) Resolution
2. Outline the general steps in preparation of culture media (5 Marks)
3. Explain the major phases of bacterial growth in a batch culture (5 Marks)
4. (a) Give two parameters that define types of centrifuges (2 Marks)  
(b) Name four types of centrifuges and briefly describe their applications. (4 Marks)
5. List the major components of a spectrophotometer and explain the function of each. (5 Marks)
6. Describe the applications of autoradiography in microbiology and biotechnology (4 Marks)

**SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)**

7. Discuss the application of microbial culture techniques in the following fields

- a) Pharmaceutical industry (5 marks)
- b) Food industry (5 marks)
- c) Environmental microbiology (5 marks)
- d) Biotechnology (5 marks)

8. Describe the roles of spectrophotometry and chromatography in quality control in industrial microbiology and biotechnology (20 Marks)

9. Describe the application of different types of microscopes in microbiological and biotechnological research (20 Marks)

