



# TECHNICAL UNIVERSITY OF MOMBASA

---

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

MASTER OF SCIENCE IN BIOTECHNOLOGY

ABT 5112: INDUSTRIAL MICROBIAL BIOTECHNOLOGY

SPECIAL/ SUPPLEMENTARY EXAMINATION

**SERIES: SEPTEMBER 2018**

**TIME: 3 HOURS**

**DATE: Sep 2018**

## **Instructions to Candidates**

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **SIX** Questions. Attempt any **FOUR** questions.

**Do not write on the question paper.**

---

## **Question ONE**

Describe the following microbial preservation methods;

- |  |           |
|--|-----------|
| a) Storage in low temperature liquid or vapor phase nitrogen | (8 marks) |
| b) Lyophilization  | (8 marks) |
| c) L-drying  | (5 marks) |
| d) Storage in distilled water                                | (4 marks) |

## **Question TWO**

Describe;

- |  |            |
|--|------------|
| a) The characteristics of important microorganism for industrial use     | (10 marks) |
| b) The criteria for the choice of raw materials used in industrial media | (15 marks) |

### Question THREE

Discuss the methods used for derangement of the metabolic control of primary metabolites  
(25 marks)

### Question FOUR

- a) Describe the production of single cell proteins from high energy sources (18 marks)
- b) Outline;
  - i) The advantages of large scale single cell protein production over the conventional food production (4 marks)
  - ii) Technical problems associated with single cell protein production than conventional food production (3 marks)

### Question FIVE

- a) Describe the stages in the industrial manufacture of cheese (15 marks)
- a. Explain the factors that affect the leavening action of yeast (10 marks)

### Question SIX

Describe;

- a) Explain the conditions and requirements needed for the production of glutamic acid by wild-type bacteria (10 marks)
- b) Describe the two main extraction methods of an amino acid from the fermentation filtrate (7 marks)
- c) Outline some of the industrial uses of amino acids (8 marks)