



# Technical University of Mombasa

Faculty of Applied and Health Sciences

## DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF  
TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY  
**BTMBT 11M**

### ABT 4309: FERMENTATION TECHNOLOGY II

SEMESTER EXAMINATION

DECEMBER 2013 SERIES

2 HOURS

Instructions to candidates:

This paper consist of **FIVE** questions

Answer question **ONE** (compulsory) and any other **TWO** questions

#### QUESTION ONE

a) Define:

- (i) Proof (1mark)
- (ii) Whisky (1mark)
- (iii) Tequila (1mark)
- (iv) Gin (1mark)

b) Explain the following;

- (i) FOUR functions of hops in beer (4marks)
- (ii) The purpose of boiling / brewing hops and wort together (4marks)
- (iii) The role of activated carbon in vodka manufacture (1mark)

c) (i) Differentiate between port and sherry wines (2marks)

- (ii) Explain THREE possible methods of achieving sweetness of dessert wines **(3marks)**
  
- d) Outline the following
  - (i) FOUR benefits of fermented foods to the consumer **(4marks)**
  - (ii) FOUR industrial uses of enzymes **(4marks)**
  
- e) Give statements on the following items;
  - (i) TWO uses of amino acids in the food industry **(2marks)**
  - (ii) TWO food grade acids produced by microorganisms **(1mark)**
  - (iii) TWO microbiologically produced vitamins **(1mark)**

## **QUESTION TWO**

Explain the manufacture of acetic acid (vinegar) **(20marks)**

## **QUESTION THREE**

Outline the manufacture of vodka under the following:

- a) Raw materials **(2marks)**
- b) Mash preparation and fermentation **(6marks)**
- c) Distillation and rectification **(6marks)**
- d) Filtration and purification **(3marks)**
- e) Dilution and bottling **(3marks)**

## **QUESTION FOUR**

Outline the manufacture of the following:

- a) Yoghurt **(10marks)**
- b) Fermented cucumber (pickles) **(10marks)**

## **QUESTION FIVE**

Discuss single cell protein **(20marks)**