



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

DIPLOMA IN FOOD TECHNOLOGY AND QUALITY ASSURANCE

AFS 2209: INTRODUCTION TO FOOD BIOTECHNOLOGY

PAPER TWO

SPECIAL/SUPPLEMENTARY EXAMINATION

**SERIES:** 2018

**TIME:** 2 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 **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

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

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## **Question ONE**

a) Define the following terminologies:

- i) Media (1 mark)
- ii) Balanced growth (1 mark)
- iii) Antifoam (1 mark)
- iv) Fermentation (1 mark)
- v) Malting (1 mark)

b) i) State three advantages of ethanol (3 marks)

ii) List three properties for ideal organism used in single cell protein production (3 marks)

c) The following are microorganisms used to produce fermented products. Provide the suitable end product.

- i) *Lactobacillus acidophilus* (1 mark)
- ii) *Penicillium chrysogenum* (1 mark)
- iii) *Aspergillus niger* (1 mark)
- iv) *Sacharomyces cerevisiae* (1 mark)

d) Briefly describe the following processes involved in beer production:

- i) Packaging (3 marks)
- ii) Malting (3 marks)
- e) Explain the following phases of microbial growth:
  - i) Lag (3 mark)
  - ii) Log (3 mark)
  - iii) Stationary (3 mark)

### **Question TWO**

- a) Describe the three types of microbial growth (6 marks)
- b) Explain the three models of fermentation used in industrial application (9 marks)

### **Question THREE**

Discuss methods of immobilizing enzymes (15 marks)

### **Question FOUR**

- a) Explain characteristics of secondary metabolites (15 marks)

### **Question FIVE**

Describe fermentation for penicillin production (15 marks)