



2<sup>nd</sup> SEM. 2016/17

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**UNIVERSITY OF SWAZILAND  
SUPPLEMENTARY EXAMINATION PAPER**

**PROGRAMME** : **BACHELOR OF SCIENCE IN FOOD  
SCIENCE, NUTRITION AND TECHNOLOGY  
YEAR IV**

**COURSE CODE** : **FSNT 406**

**TITLE OF PAPER** : **FERMENTATION TECHNOLOGY**

**TIME ALLOWED** : **TWO (2) HOURS**

**INSTRUCTIONS** : **ANSWER QUESTION ONE (1) AND ANY  
OTHER TWO (2) QUESTIONS. ILLUSTRATE  
YOUR ANSWERS WITH DIAGRAMS  
WHERE NEEDED**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY  
THE CHIEF INVIGILATOR**

**QUESTION 1 (COMPULSORY)**

- (a) Discuss the types of solid state fermentation based on the solid phase used.

(20 Marks)

- (b) Using flow charts, discuss the process steps for red and white wine manufacture.

(20 Marks)

**TOTAL MARKS = 40]**

**QUESTION 2**

- (a) Explain the following:

- i. Direct-to-vat
- ii. Downstream process
- iii. Growth associated products
- iv. Set yoghurt

(4×5 = 20 Marks)

- (b) Outline the desirable characteristics of dairy culture.

(10 Marks)

**[TOTAL MARKS = 30]**

**QUESTION 3**

- (a) Identify **five (5)** factors affecting fermentation using dairy starter cultures and describe any **two (2)** further.

(15 Marks)

- (b) Describe the steps in cultured butter milk using a flow chart.

(15 Marks)

**[TOTAL MARKS = 30]**

**QUESTION 4**

- (a) Describe the fermentation of grain whiskey.

(15 Marks)

- (b) Describe **three (3)** bioreactors for solid and submerged fermentation.

(15 Marks)

**[TOTAL MARKS = 30]**