



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY  
FACULTY OF APPLIED SCIENCES  
DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY**

**BACHELOR OF SCIENCE HONOURS DEGREE IN APPLIED  
BIOLOGY AND BIOCHEMISTRY**

**FOOD TECHNOLOGY II SBB 4207**

**EXAMINATION PAPER  
MAY 2017**

This examination paper consists of 2 pages

**Time Allowed: 3 hours**

**Total Marks: 100**

**Special Requirements: None**

**INSTRUCTIONS TO CANDIDATES**

- 1. Answer Four (4) Questions. Each question carries 25 marks.**
- 2. Where a question contains subdivisions, the mark value for each subdivision is given in brackets.**
- 3. Illustrate your answer where appropriate with large, clearly labelled diagrams.**

1. (a) Explain the importance of malt diastatic power and describe the laboratory method for its determination. (15 marks)  
  
(b) With respect to the activity of alpha- and beta-amylase, explain how mashing temperature influences wort composition and beer quality. (10 marks)
2. Discuss the mashing methods and associated biochemical processes suitable for a grist comprised of unmalted cereal adjuncts and less well modified malt.
3. (a) Explain the role of hops in brewing and the factors influencing hop utilization. (15 marks)  
  
(b) Explain the lectin theory of yeast flocculation and the flocculation phenotypes of brewing yeast. (10 marks)
4. Describe the processes that result in production of the following by-products of yeast metabolism and their effects on beer flavor and aroma:
  - (i) Diacetyl. (6 marks)
  - (ii) Ethyl acetate. (6 marks)
  - (iii) Glycerol. (5 marks)
  - (iv) Fusel alcohols. (8 marks)
5. (a) Explain the effect of barrel aging on the flavor and aroma of matured red wines. (10 marks)  
  
(b) Discuss the role of lactic acid bacteria in wine fermentations. (15 marks)
6. Discuss the differences between malt and grain whiskies and the technologies for their production.