

**2<sup>ND</sup> SEM. 2011/2012**

**UNIVERSITY OF**



**SWAZILAND**

**FINAL EXAMINATION**

**PROGRAMME : BACHELOR OF SCIENCE IN FOOD  
SCIENCE, NUTRITION &  
TECHNOLOGY YEAR III**

**COURSE CODE : FSNT 307/401**

**TITLE OF PAPER : FOOD NUTRIENT ANALYSIS**

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

**INSTRUCTIONS : ANSWER QUESTION ONE  
AND ANY OTHER TWO (2)  
QUESTIONS**

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GRANTED BY THE CHIEF INVIGILATOR**

**QUESTION 1 [COMPULSORY]**

- a) Draw two labelled typical graphs of alkali against pH during the titration of two fruit juices, one with one  $pK_a$  and the other with two  $pK_a$  values. (10 marks)
- b) The percentage of nitrogen in a given protein is 12.5%. Calculate the conversion factor for use in Kjeldahl protein analysis procedure. (10 marks)
- c) A food sample had a moisture content of 40% and a fat content of 30%. Calculate the fat content on a dry weight basis. (10 marks)
- d) Describe the principles of hydrometry and give two examples of its use in food analysis. (10 marks)

**[TOTAL MARKS = 40]**

**QUESTION 2**

- a) One compound has maximum absorbance at wavelength of 540 nm and another one at 450 nm. With proper justification, show which of the two compounds exhibits a higher energy transition (10 marks)
- b) Briefly describe the principles of fluorescence spectroscopy. (10 marks)
- c) Explain the relationship between Transmittance and Absorbance. (10 marks)

**[TOTAL MARKS = 30]**

**QUESTION 3**

Discuss five possible sources of errors during food analysis and measures you would take to minimize them.

**[TOTAL MARKS = 30]**

**QUESTION 4**

- a) What is the difference between the principles of separation in ion exchange chromatography and electrophoresis? (10 marks)
  
- b) How can thin layer chromatography be used in identifying and estimating the amount of a compound in a food sample? (10 marks)
  
- c) Discuss one difference and one similarity between gas chromatogram and a HPLC chromatogram. (10 marks)

**[TOTAL MARKS = 30]**