



## **FACULTY OF SCIENCE**

### **DEPARTMENT OF BIOTECHNOLOGY AND FOOD TECHNOLOGY BACCALAUREUS TECHNOLOGIAE IN FOOD TECHNOLOGY**

**MODULE** FTN1BF4  
**FOOD TECHNOLOGY IV**  
**CAMPUS** DFC

### **END YEAR EXAMINATION 2015**

**DATE:** 02/11/2015

**SESSION:** 08:30-11:30

**ASSESSOR**

**DR E KAYITESI**

**INTERNAL MODERATOR**

**DR S DE KOCK**

**EXTERNAL MODERATOR**

**DR O.C WOKADALA**

**DURATION** 3 HOURS

**MARKS** 180  
100% 180

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**NUMBER OF PAGES:** 3 PAGES

**REQUIREMENTS:** 1 EXAMINATION ANSWER BOOK PER STUDENT

**INSTRUCTIONS TO CANDIDATES:**

1. Answer all the questions in the examination answer book provided.
  2. Questions may be answered in any order, but subsections of questions must be answered together.
  3. Marks will be deducted for untidy and illegible handwriting.
  4. Good luck!
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**QUESTION 1**

- 1.1 Define and explain each of the following terms associated with the protein functionality in food systems.
    - 1.1.1 Solubility (6)
    - 1.1.2 Gelation (8)
  - 1.2 Describe in details the different processing steps involved in production of gelatin. Include a description of each step on the flow diagram and describe the importance of each step in the manufacturing process. (16)
  - 1.4 Briefly describe the role of lipids in the sensory quality (colour, flavour and texture) of meat and meat products. (12)
  - 1.5 During the manufacture of a certain jam, you will use a high methoxyl pectin. Discuss the properties, advantages of this type of pectin. (8)
- [50]**
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**QUESTION 2**

- 2.1 Define rheology and explain the importance of rheology in the food industry. (7)
  - 2.2 Fluids that follow Newton's law of viscosity are called Newtonian fluids while those that do not follow Newton's law of viscosity are known as non-Newtonian fluids. With examples and use of rheograms describe pseudoplastic flow and dilatant flow. (13)
  - 2.3 Briefly explain the working principles, design, advantages and disadvantages of the following viscometers.
    - 2.3.1 Capillary flow (10)
    - 2.3.2 Rotational (10)
    - 2.3.3 Falling ball (10)
- [50]**
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**QUESTION 3**

- 3.1 State the advantages of extrusion cooking over traditional production of instant vegetable sauces. (7)
- 3.2 Write notes on the design, principles of operation, advantages and limitation of a single screw extruder. Make use of a diagram to illustrate your answer. (15)
- 3.3 Briefly explain how re-crystallisation, freeze burn and drip loss affects the quality of frozen foods. (12)
- 3.4 Briefly describe the impact of freezing and thawing on the quality of meat and discuss the preventative measures employed to mitigate (reduce/prevent) the effects of freezing and thawing on meat quality. (16)
- [50]**
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**QUESTION 4**

- 4.1 Explain the working principle of the following technologies in preserving food.
- 4.1.1 Food irradiation (4)
- 4.1.2 High pressure processing (HPP) (3)
- 4.1.3 Pulsed Electric Field Technology (PEF) (3)
- 4.2 Discuss the factors that influence the efficacy of HPP to ensure microbial food safety. (15)
- 4.3 Food irradiation treatment can be applied after packaging, so recontamination or re-infestation of the product is avoided. Discuss the effects of irradiation on physical and chemical properties of some polymeric (polyethylene, polypropylene, polystyrene, polyamide) packaging materials. (15)
- [30]**
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**TOTAL MARKS: 180**  
**100 %: 180**