



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**  
**UNIVERSITY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN**  
**FOOD SECURITY**  
**1<sup>ST</sup> YEAR 2<sup>ND</sup> SEMESTER 2020/2021 ACADEMIC YEAR**  
**SPECIAL**

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**COURSE CODE: AFB 3121**

**COURSE TITLE: Human Physiology**

**EXAM VENUE:**

**STREAM: (BSc Food Security)**

**DATE:**

**EXAM SESSION:**

**TIME: 2 HOURS**

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**Instructions**

- 1. Answer ALL questions in Section A (compulsory) and ANY TWO questions in Section B**
  - 2. Candidates are advised not to write on the question paper**
  - 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**
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## **SECTION A [30 MARKS]**

### **Answer ALL Questions in this Section**

1. Give the relationship between the body content of the following nutrients, and the stage of growth of a person:
  - a. Water, sodium and chloride (2 marks)
  - b. Potassium, nitrogen and calcium (2 marks)
2. Differentiate between somatic sensory nerves and visceral sensory nerves. (4 marks)
3. List three types of muscles found in the human body. (3 marks)
4. Explain the role of lungs in acid-base balance. (3 marks)
5. Differentiate between tubular re-absorption and tubular secretion in the kidney nephron. Give examples. (4 marks)
6. Distinguish between luminal phase and membranous phase digestion. Give examples. (4 marks)
7. Briefly describe the process of gaseous exchange between alveolus and blood. (4 marks)
8. Briefly describe starch digestion in the small intestine. (4 marks)

## **SECTION B [40 MARKS]**

### **Answer ANY TWO questions from this section**

1.
  - a. Describe morphological (structural) and functional differences between arteries and veins. (10 marks)
  - b. Describe the functions of neutrophils, eosinophils and lymphocytes. (10 marks)
2. Muscle contraction involves interaction between ATP, myosin, actin, calcium and troponin. Fully describe the process of contraction, including the events that precede the contraction, when a nerve signal arrives at the sarcolemma. (20 marks)
3. Describe the functional organization of the human digestive system. (20 marks)
4. Discuss the following:
  - a. Functions of insulin in the liver, skeletal muscle and adipose tissue (10 marks)
  - b. Functions of hormones of the adrenal medulla. (10 marks)