JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

DEPARTMENT OF PLANT, ANIMAL AND FOOD SCIENCES

FIRST YEAR FIRST SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN FOOD SECURITY AND SUSTAINABLE AGRICULTURE

2020/2021 ACADEMIC YEAR

REGULAR

COURSE CODE: AFB 6111

COURSE TITLE: Characterization and Optimization of Edible Insect Production

EXAM VENUE: **STREAM: PhD. Food Security and Sustainable Agriculture**

DATE:15/2/21   **EXAM SESSION:9-12 NOON**

TIME: 3 HOURS

Instructions:

1. **Answer question ONE and ANY other 2 Questions**

2. **2.   Candidates are advised to write on the text editor provided, or to write on a foolscap, scan and upload alongside the question**

3. **3.   Candidates must ensure they submit their work by clicking "finish and submit attempt" button at the end.**

1. **a)** Which of the following reasons support the use of gregarious desert locusts as a food additive for reducing the severity of COVID-19 pandemic **(I Mark)**

    (i) Contains relatively more vitamins A, zinc, iron and calcium

    (ii) Presence of magnesium, proteins, manganese and vitamins

    (iii) More chitin, carbohydrates, potassium and phosphorous

    (iv) None of the above

(b) Insecticide application technologies including Ultra low volume (ULV) spraying is currently used as a rapid response strategy against unprecedented outbreaks in Kenya. Which of the following reasons explain why this type of strategy is not sustainable? (**1 Mark**)

    (i) Unknown environmental impact

    (ii) Negative effects on non-target organisms,

    (iii) Insecticides are manufactured outside Kenya

    (iv) Resistance and resurgence of the pest

(c) Explain why a repository of edible insects should be established in a university (**4 Marks)**

d) How would you actively collect edible insects from natural forest ecosystem in western Kenya? **(3 Marks)**

e) Using specific examples, list four orders in class Insecta that are currently used for food and feeds in Africa. **(4 Marks)**

f) Why should geographical information systems be applied in the study of rare species of edible insects in the Lake Victoria Basin? **(3 Marks)**

g) Understanding the biology of edible insects is a requirement for their domestication and mass rearing on a large economic scale. As a researcher describe eight desirable characteristics that will be considered for mass production of such insects. **(4 Marks)**

2. Highlight and describe case studies where different criteria have been used to characterize and optimize edible insects. **(20 Marks)**

3. Using relevant examples, discuss how the culture of eating insects will contribute to food security, livelihoods and environment in Africa. **(20 Marks)**

4. You are appointed to roll-out and manage a pilot project on the use of edible insects as a stimulus for economic growth of a country in Sub-African Africa, explain research areas that you would prioritize to ensure that the intended goal of the project is achieved within five years. **(20 Marks)**

5. How will you evaluate mating preferences of edible insects and how can the nutritional composition of such insects be determined before being applied as food-additives in a meal for primary school going children in Yemen. **(20 Marks)**