



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY IN FOOD SECURITY AND SUSTAINABLE  
AGRICULTURE  
2024/2025 ACADEMIC YEAR**

**REGULAR**

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**COURSE CODE: AFB 6121**

**COURSE TITLE: INNOVATIVE EXTENSION APPROACHES AND  
TECHNOLOGY UPTAKE**

**EXAM VENUE:**

**STREAM: PhD FSSA**

**DATE:**

**EXAM SESSION:**

**TIME: 3 HOURS**

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**Instructions:**

- 1. Answer ALL questions in section A and ANY other 3 Questions in section B**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

**SECTION A [15 MARKS]. ANSWER ALL QUESTIONS IN THIS SECTION.**

Q1. You are the newly appointed Director of Agriculture in your new station of duty and you are meeting a group of Farmers to select the Horticultural produce with the greatest potential for support by an identified Development Partner.

- The selection of the crops is to be based on weighting and ranking, to employ the following criteria: Profitability of commodity; Existence of a good and growing market (locally, nationally and internationally); the number of potential beneficiaries involved in the production of the commodity; Existence of value chain leadership and; Investment requirement at entry.
- During the weighting exercise, each crop is to be given a weighted score of between 0-20 by the participants depending on the above criteria.

a) Using your knowledge of the Participatory Weighted selection and table 1 below. Where Respondent scores are given by commodity. Select the top 3 Horticultural produce to be considered for support. **(8 Marks)**

**Table 1: Respondents Selection Results, by commodity, November 2019**

Criteria	Cabbage	Kales	Spinach	Tomato	Onions	Carrots
Profitability	13	14	15	17	17	12
Growing market	16	12	16	18	17	13
Number of beneficiaries	17	15	15	17	16	13
Value chain leadership	17	13	14	19	17	14
Initial investment	15	12	17	17	18	16

b) By subjecting the top 3 Commodities to a Participatory Ranking selection on the basis of the above 5 criteria on a Likert scale of 1 to 5 (with 1 = worst case scenario; and 5 = Best case scenario, use the results in Table 2 below to identify the leading commodity to be supported first. **(7 Marks)**

**Table 2: Respondent Ranking Selection Results, by commodity in ascending order**

Criteria	Number 1	Number 2	Number 3
Profitability	4	4	4
Existence of growing market	3	5	4
Number of beneficiaries	4	4	3
Value Chain leadership	4	4	4
Initial investment	3	4	4

**SECTION B [45 MARKS]. ANSWER ANY 3 QUESTIONS IN THIS SECTION.**

Q2. The dissemination of relevant information and advice to farmers has a long if chequered history prior to the emergence of modern forms of agricultural extension in the nineteenth century.

- a) Using the notion of “Distant origin) and a chronology of events, discuss the evolution of the term “Extension”. **(5 Marks)**
- b) Identify and briefly describe any TWO emerging concepts as indicators of Paradigm shifts in agricultural Research and Development. **(5 Marks)**
- c) In each case of the emerging concepts in Q1 b above, explain the defining features of each concept. **(5 Marks)**

Q3. Agricultural Research and Technology Development is undergoing a paradigm shift that entails a changed environment under which agricultural research and extension systems are operating in terms of their organizational structure, management style and field operations.

- a) Discuss THREE Key emerging concepts and perspectives associated with this paradigm shift in agricultural research and development. **(6 Marks)**
- b) Describe any FOUR Examples of International Agricultural Extension Experiences. **(6 Marks)**
- c) Explain the concept of “New Funding Mechanisms’ as a strategy in the changed environment for agricultural research and development. **(3 Marks)**

Q4. Despite the great prospects of agricultural innovations, the uptake by smallholder farmers in sub-Saharan Africa seems to be sluggish since their lack of economic resources restricts access to alternate livelihoods.

- a) Describe Information and Communication Technology (ICT) contributions to Agricultural development. **(5 Marks)**
- b) Identify and discuss any THREE Platforms and selected programmes facilitating ICT applications in agriculture. **(5 Marks)**
- c) Briefly discuss why adoption of innovative agricultural technologies is important. **(2 Marks)**
- d) Using any THREE specific country examples, describe ICT contributions to developments in the agricultural and food sector. **(3 Marks)**

Q5. a) Discuss pertinent challenges affecting the agricultural sector in the Sub-Sahara African region. **(4 Marks)**

b) State and briefly explain any FIVE Environmental Impact Assessment benefits. **(5 Marks).**

c) Briefly explain the reasons for overemphasis of Economic factors in the Technology impact analysis. **(3 Marks)**

d) Describe the limitations of the comparative Statics approach of analyzing the impacts of agricultural technology. **(3 Marks)**