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University Examinations 2024/2025

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DIPLOMA IN AGRICULTURE

AAD 2407: RESEARCH METHODS AND PROPOSAL WRITING

DATE: DECEMBER 2024

TIME: 1½ HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE (30 MARKS)

- a) Outline two advantages of using a questionnaire. (2 Marks)
- b) Outline the major steps in research. (4 Marks)
- c) Morgarn a diploma student has the following research queries for his/her proposal use the following research problems to answer questions (i), (ii), (iii) (iv)
Research Query 1: How does rotating crops affect soil nutrient content in organic farming systems?
Research Query 2: What role do cover crops play in suppressing weeds in vegetable production?
Research Query 3: In what ways do biofertilizers enhance the growth and yield of rice crops?
Research Query 4: What is the effect of different levels of sunlight exposure on the growth rate of specific medicinal herbs?
Research Query 5: What are the effects of greenhouse farming on the quality and yield of leafy greens?
 - i. Identify the research problems in each of the research queries 3, 4, 5 above? (3 marks)

- ii. Formulate a Research Title for the research query 2 and 3 above? (3 marks)
- iii. Formulate 2 specific objectives for research query 1 above? (2 marks)
- iv. Identify the dependent and independent variables in each of the research queries 1,2,3 above (3 marks)
- d) Define the following terms
 - i. Quantitative research (2 Marks)
 - ii. Conceptual research (2 Marks)
- e) Give two types of research methods (2 Marks)
- f) State 2 characteristics of a good research topic (2 marks)
- g) Using an Illustration, explain the APA type of referencing in regards to Intext citation and list of references (4 marks)

QUESTION TWO (15 MARKS)

- a) Micheni a second year diploma student has formulated the following research questions for his proposal use the following research questions to answer questions (i), (ii), (iii), (iv)

Research Question 1: Does varying levels of water irrigation impact the growth of potato plants?

Research Question 2: Does various application methods of organic and synthetic fertilizers influence the yield of tomato plants?

Research Question 3: Does different light colour impact flowering time of sunflowers?

- i. Develop a null hypothesis for each of the research questions provided above? (3 marks)
- ii. List 3 characteristics of a good hypothesis? (3 marks)
- iii. Draw an Experimental Layout for each of the research questions provided above (6 marks)
- iv. Give 3 sources of errors he is likely to encounter in his research design. (3 Marks)

QUESTION THREE (15 MARKS)

- a) Explain four types of scales used in the interpretation of data. (8 marks)
- b) Explain four sources of errors in measurement of data in a research process. (7 marks)

QUESTION FOUR (15 MARKS)

As a researcher at an agricultural science institute, you are responsible for evaluating research proposals from two different teams seeking project funding. Proposal A aims to explore the benefits of integrated pest management on crop health and productivity, whereas Proposal B focuses on assessing the potential of vertical farming systems for increasing urban food production. Discuss the eight steps in research process. (8 Marks)

- i. State four guidelines into conducting a literature review. (4 Marks)
- ii. State two sources of literature review. (2 Marks)
- iii. Highlight one guideline used to determine the scope of literature review (1 mark)