



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

**SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**

**FOURTH YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE  
DEGREE OF BACHELOR OF MASTER OF SCIENCE IN AGRICULTURE  
EDUCATION AND EXTENSION**

**2016/2017 ACADEMIC YEAR**

**REGULAR**

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COURSE CODE: AEE 5121

COURSE TITLE: Quantitative Methods

EXAM VENUE:

STREAM: MSc. Agric & Extension

DATE:

EXAM SESSION:

TIME: 2 HOURS

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Instructions:

1. Answer ALL the questions in section A and any TWO 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.
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**SECTION A [30 MARKS]**

**Answer ALL questions from this Section.**

1. Q1. (a) Define the following terminologies: Experiment, survey, experimental error, factor, variable ( 5 marks)  
  
(b) State and give examples of two types of variables (3 marks)  
  
(c) Differentiate between sample and population (2 marks)  
  
(d) Give five examples of experiments that can be carried out in agriculture (3 marks)  
  
(e) What is the difference between frequency and relative frequency? (2 marks)
  
- 2 (a) the following were the length (cm) of insects in containment: 5, 6, 7, 8 and 9. Calculate the mean, variance and standard deviation (5 marks)  
  
(b) Define mean, mode and median and calculate them in the following set of numbers: 4.4, 4.9, 4.2, 4.8, 4.5, 4.3, 4.8, 4.7, 4.2, and 4.4 (5marks)  
  
(c) Define coefficient of variation (C.V) and calculate it when the sample standard deviation(S) is 2.5 and mean is 35 (5 marks)

**SECTION B [30 MARKS]**

**Answer any TWO QUESTIONS in this Section.**

3. Q3. (a) Define three types of agricultural designs with their merits and demerits ( 5 marks)  
  
(b) Explain randomization, replication, roles of replication in an experiment and factors that determines the number of replications (5 marks)  
  
(c) State the steps in experimentation (5 marks)
  
4. An experiment to determine the effect of 5 treatments was carried out using a completely randomized design (CRD) and the results are given in the table below

		<b>Treatments</b>				
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Replicate</b>	1	42.2	28.4	18.8	41.5	33.0
	2	34.9	28.0	19.5	36.3	26.0
	3	29.7	22.8	13.1	31.7	30.6
	4		18.5	10.1	31.0	

	5		19.4		28.2	
Total ( $T_i$ )		<b>106.8</b>	<b>117.1</b>	<b>61.5</b>	<b>168.7</b>	<b>89.6</b>
Mean ( $Y_i$ )		<b>35.60</b>	<b>23.42</b>	<b>15.38</b>	<b>33.74</b>	<b>29.87</b>

- (a) Perform the necessary calculations and draw a complete ANOVA table (7 marks)
- (b) Calculate the coefficient of variation ( 2 marks)
- (c) Calculate the standard error of the mean (2 marks)
- (d) What are assumptions of the ANOVA model ( 4 marks)

5. (a) In one state, 52% of the voters are Republicans, and 48% are Democrats. In a second state, 47% of the voters are Republicans, and 53% are Democrats. Suppose a simple random sample of 100 voters is surveyed from each state. What is the probability that the survey will show a greater percentage of Republican voters in the second state than in the first state? ( 5 marks)

(b) Twenty four people had a blood test and the results are shown below.

A , B , B , AB , AB , B , O , O , AB , O , B , A AB , A , O , O , AB , B , O , A , AB , O , B , A

Construct a frequency distribution for the data. (5 marks)

(c) If a person is selected randomly from the group of twenty four people, what is the probability that his/her blood type is not O? (5 marks)