



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

**SECOND YEAR FIRST SEMESTER UNIVERSITY EXAMINATION FOR THE
DEGREE OF BACHELOR OF SCIENCE IN ANIMAL SCIENCE/HORTICULTURE
2016/2017 ACADEMIC YEAR**

REGULAR

COURSE CODE: AAS 3211/AHT 3216

**COURSE TITLE: INTRODUCTION TO STATISTICS/ INTRODUCTORY
STATISTICS**

EXAM VENUE:LR 4

STREAM: BSc. (Animal Science/Horticulture)

DATE: 19/12/17

EXAM SESSION: 2.00 – 4.00PM

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in section A and ANY other 2 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: [30 MARKS]

Answer ALL questions from this Section.

QUESTION ONE [SIX MARKS]

Distinguish between the following terms:

- a. Population and Sample [2 Marks]
- b. Quantitative and Qualitative variables [2 Marks]
- c. Nominal and Ordinal measurement scales [2 Marks]

QUESTION TWO [SIX MARKS]

y	0	1	3	4
p(y)		1/5	2/5	1/10

- a. What is $p(0)$ [1 mark]
- b. Find the expected value of y [2 marks]
- c. Find the standard deviation of y [3 marks]

QUESTION THREE [NINE MARKS]

For the following measurements: 13, 21, 9, 15, 13, 17, 21, 9, 19, 23, 11, 9, 21. Find the:

- a. Mean [2 Marks]
- b. Median [4 Marks]
- c. Quartile deviation [3 Marks]

QUESTION FOUR [NINE MARKS]

Given five pairs of points (x, y) as in the table below;

y	0	0	1	1	3
x	-2	-1	0	1	2

- a. Plot the points and draw a graph using the plots [2 marks]
- b. Find the least-squares line for the data [4 marks]
- c. Use the line in b. above to find:
 - i. x when $y = 1.65$ [2 marks]
 - ii. y when $x = 1.25$ [1 mark]

SECTION B: [40 MARKS]

Answer ANY TWO questions from this Section.

QUESTION FIVE [20 MARKS]

A

y	0	1	3	4
p(y)		1/5	2/5	1/10

- i. What is $p(0)$ [1 mark]
- ii. Find the expected value of y [2 marks]
- iii. Find the standard deviation of y [3 marks]

b. The average personal yearly income of farmers in a county is \$6 200, with standard deviation of \$ 400. i. If a sample of 64 people is randomly chosen from the county, find the probability that the mean income for the sample exceeds \$ 6 300.

c. An agricultural store has the following entries in one of the records.

Unit	Yield	Treatment	Variety	Remarks
1	11.8	A	1	Good
2	7.8	B	1	Poor
3	9.7	C	2	Fair
4	6.4	D	2	Poor
5	8.3	A	3	Fair
6	10.6	B	3	Good
7	15.5	C	4	Excellent
8	14.8	D	4	Excellent

Using the table answer the questions:

- i. Identify the observations [1 mark]
- ii. Identify the variables in the dataset [2 marks]

- iii. Classify Treatment and Variety in terms of their measurement scale: Treatment [4 marks]

QUESTION SIX [20 MARKS]

The county assembly in Siaya plans to expand the items on which cess tax would be imposed. 30 possible tax rates (as percentage of value of goods) were proposed as follows.

83	91	88	82	81
84	62	93	50	63
96	68	73	80	97
95	91	38	82	72
88	83	78	93	69
78	91	87	84	91

- a. i. Represent the proposals using a grouped frequency distribution table [7 marks]

ii. Determine the modal tax rate [1 mark]

- b. i. The mean tax rate [5 marks]

ii. Determine the median tax rate [7 marks]

QUESTION SEVEN [20 MARKS]

- a. The amount of additives x fed to cows and milk production, y are displayed in the table below

x	1	2	3	4	5
y	2	4	5	6	8

- i. Find regression of y on x [5 marks]

ii. Find the correlation coefficient amount of additive and milk production [4 marks]

iii. Explain your answer in ii. above [2 marks]

- b. The table below presents a classification of 150 farms sampled according to four varieties of seed maize and whether their germination was above average (A) or below average (B)

	Germination	Germination	
Seed	Above	Below	Total

variety	average(A)	average (B)	
P	20	40	60
Q	10	10	20
R	20	10	30
S	25	15	40
Total	75	75	150

- i. Prepare the joint probability table based on these sample data [5 marks]
- ii. Using the joint distribution table find; $p(A \text{ or } B)$, $p(A/P)$, $p(S/B)$ [4 marks]

QUESTION EIGHT [20 MARKS]

a. A manufacturer of buttons wished to determine whether the fraction of defective buttons produced by three machines varied from machine to machine. Samples of 400 buttons were selected from each of the three machines and the number of defectives counted for each sample.

The results were as follows:

Machine number	1	2	3
Number of defectives	16	24	9

- i. State the hypothesis [2 marks]
 - ii. Do these data present sufficient evidence to indicate that the fraction of defective buttons varies from machine to machine at 5% confidence level [6 marks]
- b. A marketing research firm believes that approximately 12.5% of all persons mailed a betting offer will respond if a preliminary mailing of 10,000 is conducted in a fixed region.
- i. What is the probability that 1,000 or fewer will respond? [3marks]
 - ii. What is the number of respondents if 70% of the people are expected to respond? [3 marks]
- c. A fair coin is tossed two times.
- i. List all the possible outcomes [2 marks]
 - ii. Find the variance of number of tails that show [4marks]