CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EMBU CAMPUS

**EXAMINATION FOR THE AWARD OF DEGREE OF
MASTERS OF SCIENCE IN AGRICULTURAL ECONOMICS**

AGEC 850: STATISTICS FOR AGRICULTURAL ECONOMICS

STREAMS: MSC (AGEC)   **TIME: 3 HOURS**

DAY/DATE: THURSDAY 09/08/2018   **2.30 PM – 5.30 PM**

INSTRUCTIONS:

- **Answer any Three Questions**
- **Use of calculators and statistical tables is allowed**
- **Do not write anything on the question paper**

QUESTION ONE

(a)   Discuss the various types of data measurements and data organization methods.

[8 marks]

(b)   (i)   Explain the assumptions made in the analysis of variance.   [4 marks]

(ii)   Discuss one possible solutions if some of the assumptions are not met.

[2 mark]

(c)   Using the following statistics determine if there is a difference between the means of population A and B. use $\alpha = 0.05$?   [6 marks]

Measurement	Population A	Population B
Sample mean	3.4	4.5
Sample size	12	12
Population variance	1.5	1

QUESTION TWO (20 MARKS)

(a)   A survey was carried out to test the adoption of family technologies by farmers

Farming technology	Opinion	
	Yes	No
New	56	31
Old	18	6

Test an appropriate hypothesis at $\alpha = 0.05$.   [7 marks]

(b)   An experiment to evaluate the effect of application of sulphur to pastures on white muscle disease in lambs was carried out. The results are as follows:

Sulphur application (kg/ha)	0	5	10	20	40	50
Se blood levels of lamb	9	5	6	2	3	1

   (i)   Fit a simple linear regression line to the above data.   [7 marks]

   (ii)   Determine if the model is appropriate for relating the rate of sulphur application and the level of selenium in the blood of lambs.   [6 marks]

QUESTION THREE

(a)   A random sample of 6 agricultural sector workers and 5 industrial workers was taken and their monthly incomes obtained as follows:

Hospitality	40000	32500	38500	49500	56000	42000
Industrial	52500	36000	48500	60000	59000	?

Using an appropriate non-parametric method, determine if earnings for agricultural sector and industrial sector are the same at 5% significance level.   [8 marks]

(b)   Using the following sample data set that was obtained from two populations (A and B), construct a 95% and 99% confidence interval for the population mean.   [12 marks]

A	23	25	33	47	58	34	37	17	14	35	53	45	40	37	
B	41	40	51	65	73	53	57	34	30	57	69	83	78	79	90

QUESTION FOUR
The following results are coded prices of two products (Factor A) sampled at three locations (Factor B)

Location	Rep	Product 1	Product 2
Embu	1	5.9	5.1
	2	6.1	4.7
	3	6.3	4.6
Chuka	1	4.8	2.9
	2	5.1	4.3
	3	5.3	4.2
Meru	1	5.2	4.3
	2	5.6	4.7
	3	5.5	4.5

(a)   Write down the statistical model.   [2 marks]

(b)   Carry out the analysis of variance. Use $\alpha = 0.05$ [13 marks]

(c)   Perform Least Significance Difference (LSD) for means of the Factor B. Use $\alpha = 0.05$

[5 marks]