

**UNIVERSITY OF ESWATINI****RE-SIT/ SUPPLEMENTARY EXAMINATION****(Total Marks: 100)**

PROGRAMME:

- : B.Sc. ABE YEAR 3
- : B.Sc. AG. ECON. & AGBMGT YEAR 3
- : B.Sc. AG. EDUCATION YEAR 3
- : B.Sc. AG. EXTENSION YEAR 3
- : B.Sc. AGRON. YEAR 3
- : B.Sc. ANI. SCI. YEAR 3
- : B. Sc. ANI. SCI. (DAIRY) YEAR 3
- : B.Sc. COS YEAR 3
- : B.Sc. COS. ED. YEAR 3
- : B.Sc. FSNT YEAR 3
- : B.Sc. HORT. YEAR 3
- : B.Sc. TADM YEAR 3

PAPER : **AEM303**

TITLE OF PAPER : **Applied Agricultural Statistics**

TIME ALLOWED : **TWO (02) Hrs.**

INSTRUCTIONS

1. ANSWER **ALL** QUESTIONS.
2. QUESTIONS CARRY MARKS AS INDICATED IN THIS PAPER.
3. USE ANSWER SHEET FOR **ALL** QUESTIONS.

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR.

Question No. 1**[25 Marks]**

1. The mean live weights of a farmer's steers prior to slaughter was 180 kg in past years. This year 10 steers were fed on a new diet and obtained the following results.

190	200	200	180	199	188	185	201	210	212
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Use the sample data above with $\alpha = 0.05$ to test the research hypothesis that the mean weight for the steers on the new diet is different from 180.

Key points to be consider.

- a) State the hypotheses. **(5 Marks)**
- b) Find the critical value? **(5 Marks)**
- c) Calculate the test value? **(8 Marks)**
- d) Make decision. **(2 Marks)**
- e) Interpret your result. **(5 Marks)**

Question No. 2**[25 Marks]**

A randomized block design experiment was conducted on the response of five maize varieties (A, B, C, D and E) with four replications in Luyengo Campus and obtained the following results. (Use $\alpha = 0.01$)

Variety	Yield of Maize, kg/plot				
	Replication (Blocks)				
	I	II	III	IV	Total
A	30	32	39	33	134
B	21	20	15	15	71
C	21	19	12	11	63
D	19	14	11	12	56
E	20	18	13	14	65
Total	111	103	90	85	

- a) Write the statistical model for this experiment. **(05 Marks)**
- b) Write appropriate hypotheses for the F tests. **(05 Marks)**
- c) Construct ANOVA table including the CV. **(10 Marks)**
- d) Interpret the results. **(05 Marks)**

Question No. 3.

State the most correct answer for each of the following. [25 Marks: 5 Marks Each]

- 3.1 A good experimental design must
- avoid systematic error
 - be precise
 - allow estimation of error
 - all are correct
- 3.2 One of the following is not the component of experiment
- experimental units
 - treatment
 - method of design
 - response
 - none of the above.
- 3.3 The value of a Chi-square test statistics cannot be
- zero
 - negative
 - positive
 - determined unless the data values are given.
- 3.4 A correlation coefficient of -1 implies
- that we must have made a computational error
 - that as x variable decreases, the y variable also increase
 - that a perfect linear relationship exists between the variables
 - both b and c are correct.
- 3.5 The Mann-Whitney U test is the non-parametric test equivalent of:
- paired t-test
 - unpaired t-test
 - one-way ANOVA
 - a and b

Question No. 4.**[25 Marks]**

In order to determine the possible effect of a chemical treatment on the rate of germination of cotton seeds a pot culture experiment was conducted, 140 chemically treated seeds and 160 untreated seeds were sown. The results are given below:

	Germinated	Not Germinated	Total
Chemically treated	116	24	140
Untreated	122	38	160
Total	238	62	300

Does the chemical treatment improve the germination rate of cotton seeds (Use $\alpha = 0.05$)?

Key points to be consider.

- State the hypotheses. **(05 Marks)**
- Find the critical value? **(05 Marks)**
- Calculate the test value? **(10 Marks)**
- Make decision. **(05 Marks)**