UGANDA MARTYRS UNIVERSITY

FACULTY OF AGRICULTURE

BACHELOR OF AGRICULTURE YEAR ONE

Supplementary / Special Examinations 2015-2016

Exam: INTRODUCTION TO STATISTICS

Time: 10:00am – 01:00pm (3 Hrs)

Date: 05th August 2015

Instructions:

i. Attempt all Questions in Section A and any 3 questions from Section B

ii. Write clearly, number the questions appropriately on the answer booklet

iii. Read and understand the instructions on the last page of the answer booklet

iv. Do not write anything on a question paper

Section A: **Multiple Choice Questions**

(The answers are provided after the last question.)

1. What is the median of the following set of scores?

18, 6, 12, 10, 14

a. 10
b. 14
c. 18
d. 12

2. Approximately what percentage of scores fall within one standard deviation of the mean in a normal distribution?

a. 34%
b. 95%
c. 99%
d. 68%

3. Lets suppose we are predicting score on a training posttest from number of years of education and the score on an aptitude test given before training. Here is the regression Equation $Y = 25 + 0.5X_1 + 10X_2$, where X_1 = years of education and X_2 = aptitude test score. What is the predicted score for someone with 10 years of education and a aptitude test score of 5?

a. 25
b. 50
c. 35
d. 80

4. The standard deviation is:

a. The square root of the variance
b. A measure of variability
c. An approximate indicator of how numbers vary from the mean
d. All of the above

5. A graph that uses vertical bars to represent data is called a ____.
a. Line graph
b. Bar graph
c. Scatter plot
d. Vertical graph

6. The goal of _____ is to focus on summarizing and explaining a specific set of data.
a. Inferential statistics
b. Descriptive statistics
c. None of the above
d. All of the above

7. The most frequently occurring number in a set of values is called the ____.
a. Mean
b. Median
c. Mode
d. Range

8. As a general rule, the _____ is the best measure of central tendency because it is more precise.
a. Mean
b. Median
c. Mode
d. Range

9. Focusing on describing or explaining data versus going beyond immediate data and making inferences is the difference between _____.
a. Central tendency and common tendency
b. Mutually exclusive and mutually exhaustive properties
c. Descriptive and inferential
d. Positive skew and negative skew

10. Why are variance and standard deviation the most popular measures of variability?
a. They are the most stable and are foundations for more advanced statistical analysis
b. They are the most simple to calculate with large data sets
c. They provide nominally scaled data
d. None of the above

11. The _____ is the value you calculate when you want the arithmetic average.
a. Mean
b. Median
c. Mode
d. All of the above

12 _____ as used when you want to visually examine the relationship between two quantitative variables.
a. Bar graphs
b. Pie graphs

c. Line graphs
d. Scatter plots

13. The _____ is often the preferred measure of central tendency if the data are severely skewed.
a. Mean
b. Median
c. Mode
d. Range

14. Which of the following is the formula for range?
a. H + L
b. L x H
c. L - H
d. H – L

15. Which of the following is NOT a measure of variability?
a. Median
b. Variance
c. Standard deviation
d. Range

16. Which of the following is NOT a common measure of central tendency?
a. Mode
b. Range
c. Median

d. Mean

17. What is the median of this set of numbers: 4, 6, 7, 9, 2000000?

a. 7.5

b. 6

c. 7

d. 4

18. What is the mean of this set of numbers: 4, 6, 7, 9, 2000000?

a. 7.5

b. 400,005.2

c. 7

d. 4

Select 4 questions in section B

1. The following the record of the height in centimetre of 80 trees in an Eucalyptus forest

	Cloned				Seedling			
Block 1	169	170	183	199	196	193	159	165
	188	165	168	187	159	175	176	175
Block 2	194	177	184	165	180	166	168	172
	172	188	179	169	185	169	166	177
Block 3	179	196	177	170	176	174	190	188
	167	185	180	173	174	187	195	189
Block 4	162	173	185	165	165	195	168	185
	167	168	169	187	188	175	176	167
Block 5	172	179	169	165	188	193	159	165
	165	168	187	180	173	174	165	195

a. Organise the above data in an excel sheet (5 Marks)
b. Using the table calculate the mean, mode and median height of Eucalyptus seedlings for cloned and seedling Eucalyptus (7 Marks).
c. Establish whether the mean height of cloned and seedling eucalyptus is the same (8 Marks).

Question 3

Faculty of Agriculture records show that 6% of their employees are off duty every day. They are 5 support staff.

i. What is the probability that all the workers will be present on Monday? (7 marks)
ii. What is the probability that 2 of the workers will be absent on Monday 2014? (7 marks)
iii. All of them will be absent on Monday? (6marks)

Question 4

a. Define a mutually exclusive event , conditional probability and joint probability (10marks)

b. A firm Kayabwe Investments is competing to supply goods and services to Uganda Martyrs University farm. The probability that the firm A will get the contract is $\frac{1}{9}$ and the probability that it is a second choice is $\frac{1}{3}$; the probability that it will be in third choice is $\frac{1}{2}$. What is the probability that Kayabwe Investments will not be the first, second or third choice firm to supply goods to Uganda Martyrs University? (15marks)

Question 5

a. With example discuss how statistics can be applied in the field of Agriculture. (15 marks)
b. How can statistics be misused and how can one guard against misuse of statistics in agricultural research? (5 marks)
c. What are the causes of making wrong conclusions while conducting agricultural research and how can it be over come? (5marks)

Question 6

Table1: ANOVA for the data set

Source of Variation	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	1	1473.569	1473.569	12.886798	0.008
Residual	7	800.4305	114.3472		
Total	8	2274			

Table 2;Using regression analysis the following estimates are obtained

	Coefficients	*s.e.*	*t*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	61.58 (β_0)	6.247651	9.856565	2.353E-05	46.80703351	76.35373
Soil P	1.417 (β_1)	0.394698	3.589819	0.00885928	0.483581607	2.350206

a. Comment on the p value of the regression
b. Write an model to express Yields in terms of phosphorous fertiliser applied Hint ($Y = B_0 + B_1$)
c. Estimate the Yields if 140 Kilograms grams of phosphorous fertilisers are applied in the field
d. State the Hypothesis which guided the experiment
e. Using the results comment on the R square and P value if the level of significance was 0.05
f. Uses the knowledge of soil science to outline the factors which will influence availability of the phosphorus fertilizers in soil.
g. How does lime improve availability of phosphorus?

Question 7

With examples explain the following sampling methods and their application in a survey (20marks)

a. random sample
b. stratified sample
c. snowball sample
d. systematic sample
e. purposive sample