



**COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY**  
**DEPARTMENT OF SOIL SCIENCE AND**  
**AGRICULTURAL ENGINEERING**

**CERTIFICATE III IN COMMERCIAL AGRICULTURE**

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**AGS 301: RESEARCH FOR SUSTAINABILITY:**  
**SOURCES AND METHODS**

**FINAL EXAMINATION – TRIMESTER 2, 2017**

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*Time Allowed 3 hours plus 10 minutes reading*  
*Total marks: 100*

**INSTRUCTIONS**

1. This paper consists of **three** sections and **9** pages.
2. Answer all questions in the answer booklet provided.
3. Make sure to indicate your **identification number** in all pages you use.
4. You can use permitted calculators.
5. Statistical Tables are attached with list of formulae.
6. This exam is worth 50% of your overall mark.

<b>SECTION A</b>	20 MULTIPLE CHOICE QUESTIONS	20 MARKS
<b>SECTION B</b>	PART I: 10 TRUE/FALSE QUESTIONS	10 MARKS
	PART II: 10 FILL IN THE BLANKS	10 MARKS
	PART III: 10 MATCHING	10 MARKS
<b>SECTION C</b>	5 LONG ANSWER QUESTIONS	50 MARKS

## SECTION A:

## MULTIPLE CHOICE

(20 MARKS)

This section consists of 20 multiple choice questions worth 1 mark each. Write the letter corresponding to the best answer in the Answer Sheet provided.

1. A \_\_\_\_\_ consists of all subjects that are being studied.
  - A. Sample
  - B. Population
  - C. Data
  - D. Variable
  
2. If you classified a lecturer's performance as "Excellent", "Good", "Satisfactory" and "Poor", this would be an example of which type of variable?
  - A. Qualitative
  - B. Quantitative
  - C. Discrete
  - D. Continuous
  
3. Which of the following consists of the collection, organization and presentation of data?
  - A. Inductive Reasoning
  - B. Descriptive Statistics
  - C. Inferential Statistics
  - D. Inductive Statistics
  
4. The 'number of times per week a student misses lecture in AGS 301' is an example of which type of variable?
  - A. discrete
  - B. continuous
  - C. qualitative
  - D. nominal
  
5. The advantage of stem and leaf plots over grouped frequency distribution is that it
  - A. is more reliable.
  - B. can be used when there are lots of data values.
  - C. is a more systematic way to organize data.
  - D. can retain the actual data while showing them in graphical form.
  
6. Which one of the following variables is not categorical?
  - A. Age of a person
  - B. Gender of a person: male or female
  - C. Choice on a test item: true or false
  - D. Marital status of a person (single, married, divorced, other)

7. Twelve AGS 301 students had their test 1 marks randomly selected for class analysis.

10      13      26      35      15      28      15      24      36      40      46      26

The mode is:

A. 15                      B. 26                      C. 36                      D. 15 and 26

8. Which of the following consists of generalizing from **samples to population** by performing estimations?

- A. Population Parameter
- B. Sample Statistic
- C. Descriptive statistics
- D. Inferential Statistics

9. Which of the following is method of data collection is more expensive than questionnaires, but they are better for more complex questions, low literacy or less co-operation.

- A. Registrations
- B. Interviews
- C. Direct Observations
- D. Reportings

10. A list of 5 pulse rates is: 70, 64, 80, 74, 92. What is the median for this list?

A. 74                      B. 76                      C. 77                      D. 80

11. What are the boundaries of 25 - 26 ounces?

- A. 25.1 - 26.1 ounces
- B. 25.55 - 26.55 ounces
- C. 25.5 - 26.5 ounces
- D. 24.5 - 26.5 ounces

12. Which of the following is an appropriate measure of central tendency for nominal data?

A. Mean                      B. Median                      C. Mode                      D. Midrange.

13. Which of the following is the best measure of central tendency with outliers in the data set?

A. Mean                      B. Median                      C. Mode                      D. Average

14. The marks of five students scored out of 50 are 20, 25, 30, 40 and 35. Find the standard deviation of the marks.

A. 7.07                      B. 8.01                      C. 30                      D. 66

15. A statistical operation for collecting, processing and disseminating data on the structure of agriculture, covering the whole or a significant part of the country.

- A. Agriculture Census
- B. Agriculture Data
- C. Survey
- D. Analysis

16. \_\_\_\_\_ includes crop and livestock production, trade and prices of agricultural products and labor force information.

- A. Agricultural Census
- B. Agricultural Survey
- C. Agricultural Structures
- D. Agricultural Activities

17. Let  $X$  be the number of days per week that 30 Commercial Agriculture students do a 30 minute practical work in feild.

$X$	Number of Mothers
0	3
1	2
2	3
3	8
4	1
5	9
6	4

The mean is:

- A. 3                      B. 3.5                      C. 5                      D. 5.5

18. Which of the following is **not** an Agricultural Data Source?

- A. Food and Agriculture Organization
- B. World Food Bank
- C. Ministry of Health
- D. Ministry of Agriculture

Use the following data to answer questions 19 and 20.

12	4	4	3	6	6	12	8	6	5
7	5	3	8	6	6	12	3	12	4

19. What is the range for the above data?

- A. 2                      B. 4                      C. 6                      D. 9

20. What will be the class width if this data was to be put in 5 classes?

- A. 1                      B. 2                      C. 3                      D. 4

**SECTION B:**

**(30 MARKS)**

**Part I:**

**True/False Questions**

**(10 marks)**

1. Agricultural Statistics can be classified into 2 groups – Agricultural Activities and Agricultural Structure
2. A sample of consumers tasted a new cheese chip and rated it excellent, very good, fair or poor. The level of measurement for this market research problem is ratio.
3. The Agriculture Farmers Union consists of 5,020 members. A representative group of 248 members was selected and asked questions. The 248 is considered as the population.
4. A histogram is a graph representing the corresponding frequency distribution.
5. Statistics is the science of collecting, organizing, analyzing and interpreting data in order to make decision.
6. A variable is a characteristic or property of an individual population unit. E.g age of the employed workers is considered as a variable and so do gender of the workforce.
7. 8% of the world's land use is for agricultural activities.
8. Parameter is a measure or characteristic obtained from using the data values from a sample.
9. There are two types of statistics – Inferential Statistics and Descriptive Statistics.
10. Plant varieties and animal breeds can all be classified as Quantitative variable.

**Part II:****Fill in the Blanks****(10 marks)**

Fill in the blanks with (word or phrase or symbol or letter) the appropriate answer in the Answer Booklet.

1. A group of plants selected from the group of all plants under study is called a \_\_\_\_\_.
2. The three types of frequency distributions are \_\_\_\_\_, Ungrouped and Grouped.
3. Picking every 10<sup>th</sup> bean plant from a large plot for study would be an example of \_\_\_\_\_ sampling.
4. Two major branches of statistics are Descriptive and \_\_\_\_\_.
5. A measure obtained from sample data is called a sample \_\_\_\_\_.
6. The symbol for population standard deviation is \_\_\_\_\_.
7. An extremely high or extremely low data value is called an \_\_\_\_\_.
8. The strongest measure of central tendency with numerical data is \_\_\_\_\_.
9. \_\_\_\_\_ is subtracting the highest value minus the lowest value.
10. Another name for Qualitative variable is \_\_\_\_\_ variable.

**Part III:****Matching****(10 marks)**

Agricultural Statistics uses formulas with the associated names. Match the following names correctly with the formulas on the right.

1.	Ungrouped sample mean	A.	$\frac{\sum f(X_m - \mu)^2}{N}$
2.	Grouped Population mean	B.	$\frac{N + 1}{2}$
3.	Grouped Sample variance	C.	$\frac{f}{N}$
4.	Grouped Population variance	D.	$\frac{\sum fX_m}{N}$
5.	Sample size	E.	$l + \frac{N/2 - m}{f} \times c$

6.	Coefficient of Variation	F.	$\frac{\sum fX}{n}$
7.	Relative Frequency	G.	$n$
8.	Ungrouped median	H.	$N$
9.	Grouped median	I.	$\frac{\sum f(X_m - \bar{X})^2}{n - 1}$
10.	Population size	J.	$\frac{s}{\bar{X}} \times 100$

**SECTION C:**

**LONG ANSWER QUESTIONS**

**(50 MARKS)**

This section consists of 5 long answer questions worth 10 marks each. Write your answers in the answer booklet provided. Show all necessary working as partial marks will be awarded to partially correct answers.

**Question 1**

*Start on a new page*

**[5 + 5 = 10 marks]**

(A) CAFF dairy farm wants to research on the mean number of cows suffering from tuberculosis. The stockman randomly selects 30 cows to be tested with tuberculin out of 300 cows in the herd.

- (i) What could be the population for this study?
- (ii) What is the sampling method used?
- (iii) What is the sample for this study?
- (iv) What is the statistic for this study?
- (v) What is the parameter for this study?

(B) The following are Assignment marks of 10 students in AGS 301.

45    68    56    90    56    44    68    98    22    33

- (i) Is this a sample or population? Explain your answer.
- (ii) Classify the above data (qualitative/quantitative) and state the level of measurement.
- (iii) Draw a stem leaf plot
- (iv) Find the range.

**Question 2***Start on a new page***[4 + 4 + 2 = 10 marks]**

A sample of 20 animal weights (in nearest kilograms) was taken by Commercial Agriculture students in FNU. The following are the results:

22    27    28    33    36    37    39    39    40    40  
41    43    44    45    47    48    53    57    59    63

- (i) Construct a frequency distribution for these data using 5 classes.
- (ii) Draw a histogram and a frequency polygon on the same pair of axes.
- (iii) Draw a cumulative frequency graph, Ogive.

**Question 3***Start on a new page***[5+1+1+1+2 = 10 marks]**

The table below shows the height of coconut palms growing in Yasana plantations.

Height (meters)	2 - 5	6 - 9	7 - 10	11 - 14	15 - 18
No. of Palms	14	9	7	11	8

- i. Obtain the class boundaries and class marks of the class intervals.
- ii. What is the upper class limit of the class 11 - 14?
- iii. What is the lower class boundary of the class 6 - 9?
- iv. What is the class mark of the class 7 - 10?
- v. How many coconut palms are below 10 metres?

**Question 4***Start on a new page***[5 + 5 = 10 marks]**

A. Find the Mean, Median, Mode and Range for the following?

2.1 , 5.4 , 3.3 , 6.8 , 3.3 , 11.7 , 23 , 2.1 , 4.5, 3.3 , 2.2

B. A population consists of all goats in a farm. They are: Farm A - 204, Farm B - 215, Farm C - 207, Farm D - 212, Farm E - 214 & Farm F - 208.

- i. What is the population variance?
- ii. What is the population standard deviation?



**Question 5***Start on a new page***[5+5 = 10 marks]**

A survey of 30 farmers in a village was carried out to find the number of tomatoes each has collected in a day. The results are shown in the following table.

Number of tomatoes	1 – 10	11– 20	21 – 30	31 – 40	41 – 50
Frequency	5	6	4	5	10

Find the:

- i. mean
- ii. median
- iii. mode
- iv. variance
- v. standard deviation

**THE END**

**LIST OF FORMULAE:**

1. 
$$\text{class width} = \frac{\text{highest} - \text{lowest}}{\text{number of classes}}$$

2. 
$$\text{Midpoint} = \frac{(X_1 + X_2)}{2}$$

3. 
$$\bar{X} = \frac{\sum f \cdot X_m}{n}$$

4. 
$$s^2 = \frac{\sum f(X_m - \bar{X})^2}{n - 1}$$

5. 
$$\sigma^2 = \frac{\sum f(X_m - \bar{X})^2}{N}$$

6. 
$$\text{CoV} = \frac{s}{\bar{X}} \times 100$$