



FIJI NATIONAL UNIVERSITY

**COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY  
SCHOOL OF AGRICULTURAL SCIENCES  
DEPARTMENT OF ADMINISTRATION**

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**TRADE DIPLOMA IN WP&VA, FORESTRY, AGRO-FORESTRY & UNCLASSIFIED  
AFF 402: APPLIED MATHEMATICS & COMPUTING**

**FINAL EXAMINATION – TRIMESTER 1, 2017**

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

**INSTRUCTIONS**

1. This paper consists of **four** sections and **8** 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 calculators.
5. List of formulae is attached at the end of the paper.
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: 5 FILL IN THE BLANKS & 5 MATCHING	10 MARKS
	PART II: SAMPLING METHODS & FORMULAS	10 MARKS
	PART III: 10 TRUE AND FALSE	10 MARKS
<b>SECTION C</b>	SHORT ANSWER QUESTIONS	20 MARKS
<b>SECTION D</b>	3 LONG ANSWER QUESTIONS	30 MARKS
<b>TOTAL</b>		<b>100 MARKS</b>

**SECTION A MULTIPLE CHOICE**

**(20 MARKS)**

1. Every 10th broiler birds are selected in a livestock farm and the weight of each broiler bird is recorded. The purpose of weighing the broiler birds was to see if there was any improvement in their growth after giving them new supplements. State which type of sampling method is used.  
A. Cluster Sampling  
B. Systematic Sampling  
C. Random Sampling  
D. Judgment Sampling
2. What are the boundaries of **25-30**  
A. 24-29.5  
B. 25.5 – 29  
C. 24.5 – 30.5  
D. 25 – 30
3. Data that can be classified according to gender are measured on what scale?  
A. Nominal  
B. Ordinal  
C. Ratio  
D. Interval
4. What is one advantage of sampling?  
A. The methodology used to sample from a larger population depends on the type of analysis being performed.  
B. The sample should be a representation of the entire population.  
C. Data collection is faster than measuring the entire population.  
D. Sampling is more time consuming.
5. A \_\_\_\_\_ method is any method of sampling that utilizes some form of random selection whereby all members in a population have equal chance of being selected.  
A. Judgment Sampling  
B. Stratified sampling  
C. Quota Sampling  
D. Random Sampling
6. A researcher divides a group of students according to gender, major fields, and low, average and high grade points average. Then she randomly selects six students from each group to answer questions in a survey is an example of what type of sampling method.  
A. Cluster Sampling  
B. Systematic Sampling  
C. Stratified Sampling  
D. Judgment Sampling
7. Data that can be classified according to tree vigor are measured on what scale?  
A. Nominal  
B. Ordinal  
C. Ratio  
D. Interval

8. An urn contains 3 red balls, 2 blue balls, and 5 white balls. A ball is selected and its color is noted. A second ball is selected and its color noted. What is the probability of getting 2 blue balls?
- A. 0.1  
 B. 0.05  
 C. 0.04  
 D. 0.06

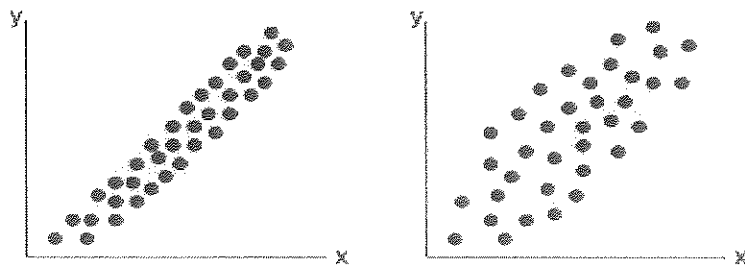
9. What is the midpoint for the class boundaries 114.5 – 119.5?
- A. 107  
 B. 127  
 C. 117  
 D. 122

10. The symbol for population mean is
- A.  $\sigma$   
 B.  $\mu$   
 C.  $\bar{x}$   
 D.  $\alpha$

11. The process of producing results from the data for getting useful information is called
- A. Output  
 B. Input  
 C. Processing  
 D. Storage

12. The task of performing arithmetic and logical operations is called
- A. ALU  
 B. Editing  
 C. Storage  
 D. Output

13. The following scatter plot indicates



- A. Strong negative correlation  
 B. Positive correlation  
 C. Negative correlation  
 D. No correlations

14. What is the value of the mode when all values in the data set are different?
- A. 0  
 B. 1  
 C. No mode  
 D. It cannot be determined

15. Except for rounding errors, relative frequencies should add up to what sum?
- A. 0  
 B. 1  
 C. 50  
 D. 100

16. Twelve bean plants were randomly selected for analysis.

10	13	26	35	15	28	15	24	36	40	46	26
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The mode is:

- A. 15                      B. 26                      C. 26 and 15                      D. No mode

17. The variance for the following data is:

30	40	50	60	70	80
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- A. 1750.20  
B. 330.01  
C. 24.17  
D. 291.67

18. Quantitative variables can be defined as:

- A. Variables that have distinct categories according to some characteristic or attribute.  
B. Variables that can be counted or measured.  
C. Variables that have a meaningful zero.  
D. Variables that do not have a meaningful zero.

19. Referring to the formula to calculate median for grouped data,  $f$  represents

$$L + \frac{n/2 - Cf}{f} \times i$$

- A. Cumulative frequency before the median group.  
B. Frequency of the median group.  
C. Class width.  
D. Frequency before the median group.

20. The symbol  $\bar{x}$  represents:

- A. Sample mean  
B. Population variance  
C. Population mean  
D. Sample variance

**SECTION B PART I (start on a new page)**

**A. FILL IN THE BLANKS**

**(5 MARKS)**

1. The \_\_\_\_\_ is a graph that represents the cumulative frequencies for the classes in a frequency distribution.
2. The three types of frequency distribution are ungrouped, grouped and \_\_\_\_\_.
3. A \_\_\_\_\_ is a characteristic or attribute that can assume different values.

4. The symbol for sample mean is \_\_\_\_\_.
5. \_\_\_\_\_ are variables that can be counted or measured.

**B. MATCHING**

**(5 MARKS)**

Write the alphabet of your choice beside each number

1. Internet	A. A software application that enables a user to locate and view pages on a web site.
2. Nominal	B. Tree vigor
3. Web Browser	C.A collection of local, regional and national computer networks that are linked together to exchange data.
4. Ordinal	D.Height
5. Continuous	E. Gender

**PART II**

**A. SAMPLING METHODS**

**(5 MARKS)**

Indicate whether each of the following is a probability or nonprobability sample. Tick below the appropriate answers.

Samples	Probability	Nonprobability
A. Cluster		
B. Stratified		
C. Judgmental		
D. Quota		
E. Random		

**B. FORMULAS**

**(5 MARKS)**

**Write down the formulas for the following:**

1. Calculating mean for raw data for sample.
2. Calculating median for grouped data.
3. Calculating variance for raw data for sample
4. Calculating mean for grouped data for population.

5. Calculating mean for ungrouped data for population.

**PART III TRUE AND FALSE**

**(10 MARKS)**

Write either **True** or **False** in the answer book provided.

1. Stratified Sampling is obtained by dividing the population into sections or clusters and then selecting one or more clusters and using all members in the cluster(s) as the member of the sample.
2. Classification is the process of arranging the data into different groups or classes according to some common characteristics.
3. Snowball sampling is a non-probability sampling method.
4. Quantitative classification means arranging data according to certain characteristic that has been measured e.g. according to height, weight and etc.
5. Tree vigor as either healthy, sick or dead can be ranked as ordinal data.
6. One of the merits of range is that it is easier to calculate and simplest to understand even for a beginner.
7. Snowball Sampling is usually done when there is a very small population size.
8. In a computer mouse is an output device.
9. Operating System (OS) is an application software.
10. Height, weight and blood pressure can be ranked as continuous data.

**SECTION C SHORT ANSWER QUESTIONS**

**(20 MARKS)**

**All questions in this section are compulsory. (Start on a new page)**

1. What are the 4 general operations that a computer performs? **(4 Marks)**
2. Determine the 3 advantages and 3 disadvantages of computers. **(6 Marks)**
3. A card of 52 is drawn from an ordinary deck. Find the probability of getting: **(5 Marks)**
  - A. A king
  - B. The 4 of spades
  - C. A face card (jack, queen or king)
  - D. A red card
  - E. A club
4. If the weights of 7 ear-heads of sorghum are 89, 94, 102, 107, 108, 115 and 126 g. **(5 Marks)**

Find the Following:

  - A. Mean
  - B. Median
  - C. Mode
  - D. Range
  - E. Upper and Lower quartiles

**SECTION D LONG ANSWER QUESTIONS**

**(30 MARKS)**

There are 3 questions in this section. ATTEMPT ALL. (Start each question on a new page)

1. The following are the 60 soybean plant heights collected from a particular plot. (15 Marks)

25 30 34 37 41 42 46 49 53 26 31 34 37 41 42 46 50 53 28 31 35 37 41  
43 47 51 54 29 32 36 38 41 44 48 52 54 30 33 36 39 41 44 48 52 55  
30 33 37 40 42 45 48 52 48 45 25 27 34 36 50

- Construct a frequency distribution table using 7 classes. (Use inclusive method).
- Find the relative frequency, percentage and cumulative frequency for the data provided.
- Draw the histogram and frequency polygon on the same pair of axis for the grouped data.
- Draw a cumulative frequency graph for the grouped data.

2. The following are the 381 soybean plant heights in Cms collected from a particular plot.

<i>Plant Heights (Cm)</i>	6 -7	8 -9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
<i>Freq.</i>	9	10	11	32	42	58	65	55	37	31	24	7

Find the following:

**(10 Marks)**

- Mean
  - Median
  - Modal Class
  - Variance
  - Standard Deviation
  - Coefficient of Variation
3. From a paddy field, 12 plants were selected at random. The length of panicles in cm ( $x$ ) and the number of grains per panicle ( $y$ ) of the selected plants were recorded. The results are given in the following table. (5 Marks)

$x$	112	131	147	90	110	106	127	145	85	94	142	111
$y$	22.9	23.9	24.8	21.2	22.2	22.7	23.0	24.0	20.6	21.0	24.0	23.1

- Calculate the value of the correlation coefficient.
- Find the coefficient of determination and interpret what it means.

**THE END**

### LIST OF FORMULAE:

1. Sample mean,  $\bar{X} = \frac{\sum f \cdot X_m}{n}$
2. Population variance,  $S^2 = \frac{\sum f(X_m - \bar{X})^2}{N}$
3. Correlation coefficient,  $r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{n(\sum x^2) - (\sum x)^2} \cdot \sqrt{n(\sum y^2) - (\sum y)^2}}$
4. The regression line  $y' = a + bx$ , where
$$a = \frac{(\sum y)(\sum x^2) - (\sum x)(\sum xy)}{n(\sum x^2) - (\sum x)^2}; \quad b = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$$
5.  $z = \frac{\bar{X} - \mu}{\sigma / \sqrt{n}}$
6. C.V = SD/ Mean x 100
7. MD =  $L + \frac{N/2 - CF}{F} \times i$