

BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

MFS 511

Department of Agricultural Economics, Education and Extension
MSc in Food Security and Sustainable Agriculture Part I Examination
Applied Research Methods

3 HOURS (100 Marks)

00 00 00

INSTRUCTIONS TO CANDIDATE

Answer question ONE from SECTION A and any TWO questions from SECTION B.

SECTION A (COMPULSORY)

- 1) The World Health Organisation (WHO) have asked you to conduct a study titled, "Household Dietary Diversity of Household in Muzarabani during the COVID-19 pandemic."
- a) Formulate a brief background to the study. (less than a page) **[6 marks]**
 - b) Formulate the problem statement for this study. (less than a page) **[7 marks]**
 - c) State three research questions for the study. **[3 marks]**
 - d) Formulate the main objective and 2 specific research objectives. **[6 marks]**
 - e) State one possible research hypotheses for the study. **[2 marks]**
 - f) State the justification for conducting the research. **[6 marks]**
 - g) State three possible limitations of the study. **[3 marks]**
 - h) Assuming that you have been asked to use a questionnaire as the main data collection instrument. List any 5 possible questions that you would include in your questionnaire in answering your stated objectives. **10 marks]**
 - i) Briefly describe the data analysis methods that you would employ in answering your stated objectives. **[7 marks]**

SECTION B

2. (a) A data set has been read in R and stored in a variable "dataframe". Write codes that will produce a summary (mean, mode, median) of the entire dataset in a single line of code? **[5 marks]**
- (b) The table shows results from an experiment of different Varieties of cowpea. The data is saved as data framed. Write an R code that plot

histogram for "Yield" variable.

[5 Marks]

Variety	State	Yield	
Alpha	Active	50	2
Beta	Active	45	5
Beta	Passive	25	0
Alpha	Passive	21	0
Alpha	Passive	26	1
Beta	Active	30	2
Beta	Passive	18	0

(c) The below dataframe is stored in a variable named data.

Data

A B

- 1 Right
- 2 Wrong
- 3 Wrong
- 4 Right
- 5 Right
- 6 Wrong
- 7 Wrong
- 8 Right

Suppose B is a categorical variable and we wish to draw a boxplot for every level of the categorical level. Write a command that will help us achieve that?

[5 Marks]

(d) Explain the importance of the following in experimental design

(i) Randomisation

[5 Marks]

(ii) Replication

[5 Marks]

3) a) Once you have constructed your questionnaire, you must pilot it.

Discuss this statement.

[10 marks]

b) State 5 potential mistakes to avoid when preparing the wording and structure of questions in a survey questionnaire.

[5 marks]

c) Using examples, differentiate between closed-ended and open-ended questions.

[5 marks]

d) Briefly explain any 5 characteristics of a good questionnaire.

[5 marks]

4) Discuss the following sampling techniques:

i. Stratified Sampling

[5 marks]

ii. Systematic Sampling

[5 marks]

- iii. Random Sampling
- iv. Purposive Sampling
- v. Cluster Sampling

[5 marks]

[5 marks]

[5 marks]

END OF PAPER