

BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

AGC225

Department of Animal Science
BSc Agricultural Science Part II Examination
Statistical Methods and Experimental Designs

2 HOURS (70 Marks)

INSTRUCTIONS TO CANDIDATES

Answer question number **1** from SECTION A, and any **TWO** questions from SECTION B.

SECTION A (COMPULSORY)

1.

- a) Explain the differences between a problem statement and a research question.
[4 marks]
- b) State what an experiment can prove that an observational study cannot. [2 marks]
- c) Explain the kind of information that make up each of the following sections of a research document;
 - i. Data analysis. [6 marks]
 - ii. Abstract. [4 marks]
 - iii. Recommendations. [4 marks]
 - iv. Results. [6 marks]
- d) Explain the significance of the following approaches to research designing;
 - i. Treatment Replication. [2 marks]
 - ii. Triangulation. [2 marks]

SECTION B (CHOOSE ANY TWO QUESTIONS)

2.

- a) Distinguish the following, giving examples;
 - i. Random and non random sampling. [2 marks]
 - ii. Real and statistical population. [2 marks]
 - iii. Parameter and sample. [2 marks]
- b) Describe how snowball sampling is conducted. [7 marks]
- c) Describe the ideal conditions where simple random sampling is most ideal to employ. [7 marks]

3. An experiment was designed to compare 3 different dips for their effectiveness in controlling ticks in cattle with significantly heavy tick loads. For replication, 5 cattle dip tanks were used for each dip, with the same number of cattle observed at each dip tank. Tick load was determined at the end of dipping. Using the data below determine if there is evidence that the type of dip used affect tick load. Use $\alpha = 0.05$. [20 marks]

Dip	A	B	C
3.			
4.	1200	1300	1700
5.			
6.	1100	1500	1300
7.	1000	1000	1500
8.			
9.	1500	1800	1500
10.	1100	1200	1600

4.

- a) Distinguish between surveys and questionnaires. [4 marks]
- b) Distinguish the methods of questionnaire ordering. [4 marks]
- c) Distinguish the methods of questionnaire administration. [4 marks]

d) Explain the importance of the various steps in designing a questionnaire.

[8 marks]

5. Identify the ethical norms violated in each of the following scenarios and the likely consequences of such acts of misconduct,

a) Publishing the same paper in two different journals without telling the editors.

[4 marks]

b) Not informing a collaborator of your intent to file a patent in order to make sure that you are the sole inventor.

[4 marks]

c) Including a colleague as an author on a paper in return for a favor even though the colleague did not make a serious contribution to the paper.

[4 marks]

d) Using an inappropriate statistical technique in order to enhance the significance of your research.

[4 marks]

e) Bypassing the peer review process and announcing your results through a press conference without giving peers adequate information to review your work.

[4 marks]

END OF PAPER