



**1<sup>st</sup> SEMESTER 2009/2010**

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**UNIVERSITY OF SWAZILAND**

**FINAL EXAMINATION**

**PROGRAMME: BACHELOR OF SCIENCE IN ANIMAL SCIENCE  
YEAR III**

**COURSE CODE: APH 307**

**TITLE OF PAPER: RESEARCH METHODS**

**TIME ALLOWED: TWO (2) HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER THREE (3)  
QUESTIONS**

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THE CHIEF INVIGILATOR**

**QUESTION 1**

(a) What is the aim of research? (2 marks)

(b) A fourth year animal science student is given a large field to conduct a study on Lucerne (*Medicago sativa*), one of the best forage legume species in the world. She conducts the study to examine the combined effect of planting date and seeding rate on dry matter yield and crude protein content. There are two planting dates, early and late season planting; there are also two seeding rates (kg/ha), low and high seeding rate.

The study field has four soil types: gravel (stony), sandy, loam and clay. For each treatment combination, she uses 5m x 5m plots.

At the end of the growing season, she samples her plots by direct harvesting of 1m x 1m frames within each plot.

(i) What type of research is this study? (1 mark)

(ii) What is/are dependent variable(s)? (2 marks)

(iii) What is/are independent variable(s)? (2 marks)

(iv) What is the experimental unit? (2 marks)

(v) What is the sampling unit? (2 marks)

(vi) What is the treatment structure? (2 marks)

(vii) Name and illustrate the appropriate design structure for this study. (8 marks)

(c) Name the four characteristics of a well designed experiment? (4 marks)

**QUESTION 2**

(a) Discuss briefly and clearly the steps in planning good research under the following headlines:

(i) Statement of the problem

- (ii) Statement of objectives and hypotheses
- (iii) Design and procedure
- (iv) Limitations (13 marks)

(b) Mention the target population and the primary sampling design you would use in the following scenarios:

- (i) Views of livestock farmers on the payment of dipping chemicals.
- (ii) Perceptions of veterinary assistants in the Lubombo region on the prevalence of foot and mouth disease in this region.
- (iii) Views of 2000 Alumni Agriculture graduates on the length of field attachment
- (iv) Views of 55 academic staff members in the Faculty of Agriculture on the four year degree programmes in this Faculty. (12 marks)

### QUESTION 3

- (a) What are the three purposes of an experimental design? (6 marks)
- (b) Discuss briefly the use of the balanced Latin Square Design in animal research. (14 marks)
- (b) Give five factors that determine sample size? (5 marks)

### QUESTION 4

- (a) Highlight the precautions to be taken into account when carrying out research under the following circumstances:
  - (i) Groups of animals in pens
  - (ii) Grazing trials
  - (iii) Repeated measures

- (iv) Weighing ruminants
- (v) Missing plots (15 marks)

(b) During your final academic year you are expected to conduct a research project as part of the requirements of your degree programme. Make a complete listing of the sections that form your research proposal. (10 marks)

**QUESTION 5**

- (a) Discuss the following principles used to minimise experimental error:
- (i) Randomisation (5 marks)
  - (ii) Replication (5 marks)

(b) Describe the use of the interview method for data collection in animal survey research. (15 marks)