UNIVERSITY OF SWAZILAND

2nd SEM. 2012/2013

FINAL EXAMINATION

PROGRAMMES: B.Sc. ANIMAL SCIENCE III

   B.Sc. ANIMAL SCIENCE III (DAIRY OPTION)

COURSE CODE: AS 308

TITLE OF PAPER: RESEARCH METHODS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER <u>ANY FOUR</u> QUESTIONS

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1.

   a) **Define** sampling and briefly discuss **five** reasons why researchers generally work with samples and not populations. (18)

   b) What is a continuous variable? Give an example to illustrate that a continuous variable can be converted into a categorical variable. (7)

2. A researcher wants to study the effect of source of protein (Soyabean or marula cake) and the effect of sex of chicks on weight gain. Let SBD=diet based on soyabean and MSD=diet based on marula seed cake. The researcher has eighty (80) day old broiler chicks, half of which are male and the other half female. There are two poultry houses and each house is divided into four compartments. House#1 has an iron sheet roof while house#2 is roofed with asbestos sheets. The diagrams below show how the researcher allocated the diets and day old chicks to the compartments in the houses.

HOUSE #1

Diet=SBD Sex of chicks=Male Number of chicks=10	Diet=MSD Sex of chicks=Male Number of chicks=10
Diet=MSD Sex of chicks=Male Number of chicks=10	Diet=SBD Sex of chicks=Male Number of chicks=10

HOUSE #2

Diet=SBD Sex of chicks=Female Number of chicks=10	Diet=MSD Sex of chicks=Female Number of chicks=10
Diet=MSD Sex of chicks=Female Number of chicks=10	Diet=SBD Sex of chicks=Female Number of chicks=10

   a) What is wrong with this experimental set up? (4)

   b) How would you improve on the design? Draw a sketch of your proposed experimental layout (8)

   c) List the treatments in this study (4)

   d) How many replications are in this study? (2)

   e) Are there any blocks in your suggested design? If so identify them. (2)

   f) Write a statistical model which you would use to analyze the data from this study (5)

3.

   a) Giving an example of each, define the following (5 points each)
      i) Experimental design
      ii) Latin square design
      iii) Dependent variable
      iv) Interaction
      v) Experimental unit

4. Read the paragraph below and come up with the following:
      i). A research topic (4)
      ii). A research problem statement (4)
      iii). A general objective (4)
      iv). One specific objective (4)
      v). Significance of the proposed research (4)
      vi). A null hypothesis (2)
      vii). A research hypothesis (3)

Swaziland relies on imports for almost all the ingredients used in the compounding of poultry rations with most of the ingredients originating from the neighbouring state of South Africa. The ever increasing costs of these imported ingredients has resulted in the cost of poultry feeds in the country rising beyond the reach of most small scale broiler producers. The ever increasing feed costs have seen a sizeable number of small scale broiler farmers forced out of business. It is imperative that the country seeks local feed alternatives if the small scale farmer is to remain active in the broiler production business. The task of identifying alternative feed sources is the responsibility of the ministry of agriculture but the faculty of agriculture under the opuses of the University of Swaziland should take a leading role in evaluation of such alternative feed ingredients. Cognizant of the fact that soyabean meal which supplies the protein in broiler rations is the biggest contributor to ration cost, it is only logical to seek substitutes for this ingredient first. Researchers at the University of Swaziland have since formulated a marula cake based broiler diet whose chemical composition is comparable to the commercial ration. However, there is still need to compare the performance of broilers on the marula diet to those on the commercial diet. The 42 day weight of broilers fed the two diets would make an ideal comparison.

5. Discuss Completely Randomized Designs (CRD) under the following headings
      i). Brief description of the design (6)
      ii). Randomization (4)
      iii). Advantages (6)
      iv). Disadvantages (6)
      v). Name the most appropriate statistical test one would perform if a CRD experiment had two independent variables, one with two levels and the other with three levels. (3)