

**UNIVERSITY OF FORT HARE**  
**DEPARTMENT OF ZOOLOGY**  
**SEMESTER EXAMINATIONS: JUNE 2018**

**ZOOLOGY 212**

**ZOO 212**

**TIME: 3 HOURS**

**160 MARKS**

**Internal Examiners**

**Prof. N. Vine**  
**Prof. E. Do Linh San**  
**Dr C. Tambling**  
**Mrs N. Springbok-Njokweni**

**Instructions to Candidates**

***IMPORTANT! PLEASE READ CAREFULLY!***

All four questions are **COMPULSORY**.

Answer Questions 1 and 2 in the **FIRST ANSWER BOOK**.

Answer Questions 3 and 4 in the **SECOND ANSWER BOOK**.

Number your answers correctly using the same numbers as on the question paper.

**Number of pages: 5 including cover**

**Question 1 (to be answered in the first answer book)**

1.1 Using the Harvard referencing style, provide the correct style for the following JOURNAL reference: [5]

Title:	Aquaculture in South Africa: Potential and Pitfalls
Author:	NG Vine
Journal:	Aquaculture Research
Year published:	2012
Start page:	213
End page:	231
Volume:	21
Issue:	3

1.2 Define plagiarism in an academic context. [3]

1.3 While an experiment may be designed to generate new hypotheses it need not make a specific prediction. What FOUR questions should a well-designed experiment anticipate and resolve? [4]

1.4 A friend of your family has a problem with mosquitos biting him much more than the rest of his family. He has heard that you are a BSc student studying Zoology and wants to know whether mosquitos bite men more than women. Think about how you might answer him (do not write your answer!), and then:

- a) Identify the independent and dependent variables that would need to be tested (2);
- b) correctly state the null hypothesis (3);
- c) what kind of study is this (hint: it determines what kind and how you phrase your hypothesis)? (1)

[6]

1.5 What is Confirmation bias? (2). Explain how scientists go about correcting for this bias.[4]

1.6 What is Occam's Razor and how does it apply to competing explanations? [3]

1.7 It has been claimed that the moon has an effect on the way people behave with more people being admitted to hospitals for mental problems during the period of the full moon. Explain what observations you would need to make to determine whether this claim is indeed possibly true. [4]

1.8 A research study on the growth of chickens fed six diets of varying quality (and therefore varying cost per kg of feed) yielded the data shown in Figure 1. The study used replicates of 30 chickens per coop which had been fed the various diets while all were being maintained under the same conditions. [4]

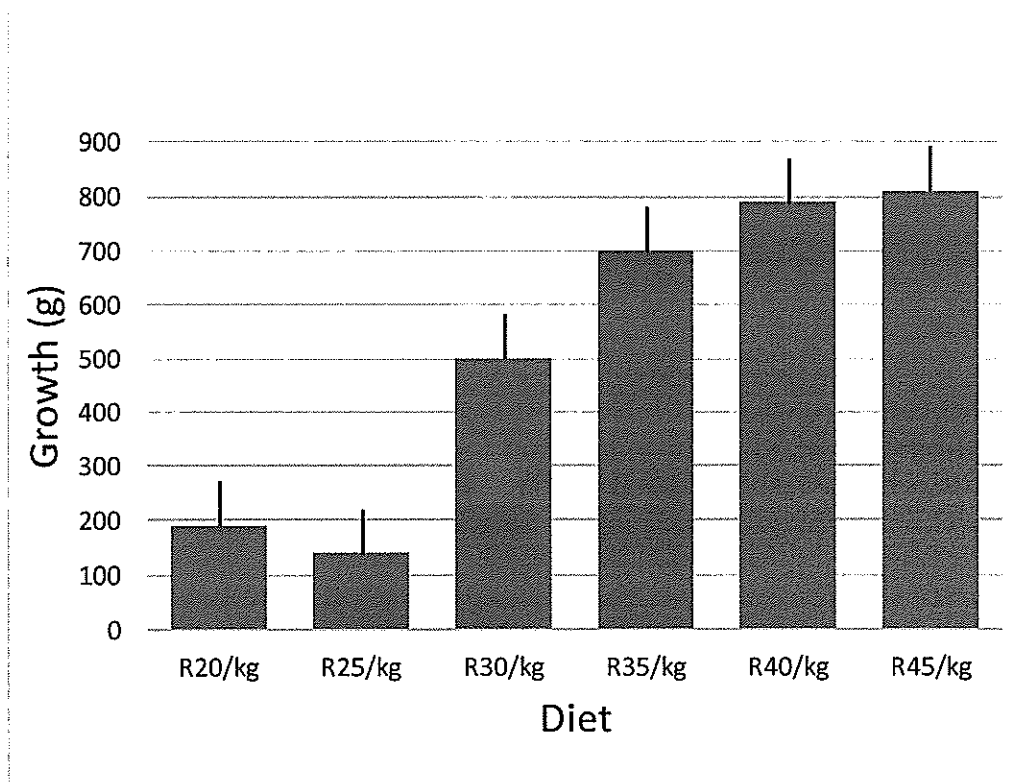


Figure 1 – Average growth (g) of broiler chickens after 56 days fed with diets of varying quality/cost (R/kg). Grey bars represent the mean of three replicates and black error bars represent 95% Confidence Interval.

You have been asked to provide guidance to the Poultry industry on the results obtained and must bear in mind that it is important for the industry to produce fast growth while remaining as economical as possible. How would you advise them on the following issues? [7]

- What diet would you recommend as being the most economical diet that would have the best growth? (1)
- Based on what reason(s) did you select this over other diets which may have produced similar growth? (2)
- Which diet(s) produced the poorest growth? (1)
- What rule of thumb can be used to determine whether a difference in a study such as this is statistically significant? (3)

**TOTAL 40**

**Question 2 (to be answered in the first answer book)**

2.1 Students of animal behaviour may ask both “ultimate” and “proximate” questions about a specific behaviour. Contrast the difference between these two approaches and indicate which of Tinbergens four questions are considered ultimate and proximate explanations of a behaviour? [6]

2.2 Describe four ways in which animals receive sensory information from the environment and contrast how these sensory systems can differ from how humans obtain sensory information. [12]

2.3 What is the difference between classical and inclusive fitness? [4]

2.4 Draw a learning curve (and include the axis labels) and describe the different components of the learning curve. Explain why it might not be a good thing for animals to have a flat learning curve and in what environment would a flat learning curve be the most advantageous? [12]

2.5 Describe three ways in which animals find food? [6]

**TOTAL 40**

**Question 3 (to be answered in the second answer book)**

3.1 Define the following: [6]

- a) allele frequency
- b) gene pool
- c) lethal mutation
- d) microevolution
- e) neutral mutation
- f) population

3.2 You have sampled a population in which you know that the percentage of the homozygous recessive genotype (aa) is 36%. Using that 36%, calculate the following: [10]

- a) The frequency of the “aa” genotype. (2)
- b) The frequency of the “a” allele. (2)
- c) The frequency of the “A” allele. (2)
- d) The frequencies of the genotypes “AA” and “Aa”. (2)

v  
4  
e) The frequencies of the two possible phenotypes if “A” is completely dominant over “a”. (2)

3.3 Explain the four steps in Darwin’s theory of natural selection [8]

3.4. List four reasons why evolution is important. [4]

3.5 List and describe six major types of evidence for evolution. [12]

**TOTAL 40**

**Question 4 (to be answered in the second answer book)**

4.1 Describe the main components of a **food chain**. Give examples of organisms belonging to the different trophic levels and explain how these are interconnected. [20]

4.2 Draw and label the **nitrogen cycle**. Briefly explain how humans interfere with or disturb this system. [12]

4.3 Explain/define the following **4 concepts** used in population ecology/dynamics. [8]

- a) **Population growth**
- b) **Carrying capacity (K)**
- c) **r-selected species**
- d) **Density-independent factor**

**TOTAL 40**