

**UNIVERSITY OF SWAZILAND**

**FINAL EXAMINATION PAPER 2016/17**

**TITLE OF PAPER:**            **Research Methods**

**COURSE CODE:**            **BIO607**

**TIME ALLOWED:**            **THREE HOURS**

**INSTRUCTIONS:**            **1. THE EXAMINATION HAS FOUR (4)  
QUESTIONS. ANSWER ANY THREE (3).  
2. EACH QUESTION CARRIES 30 MARKS.  
3. ILLUSTRATE YOUR ANSWERS WITH  
LARGE AND CLEARLY LABELLED DIAGRAMS  
WHERE APPROPRIATE.**

**SPECIAL REQUIREMENTS:**            **NONE**

**THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN  
GRANTED BY THE INVIGILATORS**

**QUESTION 1**

What is a Generalized Mixed Linear Model and how does it differ from a General Linear Model? Explain why the former is a useful tool for an ecologist.

[30 Marks]

**QUESTION 2**

Explain the various multivariate statistical analyses that can be performed by the R Package “Vegan”. Make sure that you include in your discussion the possible application of these analyses to ecology.

[30 Marks]

**QUESTION 3**

“GIS is critical for effective conservation ecology”. Discuss this statement.

[30 Marks]

**QUESTION 4**

GIS can be very expensive to purchase, and hence various open source alternatives have emerged including QGIS and the program R. How do the open source products compare with ArcMap which needs to be purchased? Provide a critical review of this subject and make sure to include the functionality of each system.

[30 Marks]