UNAM
UNIVERSITY OF NAMIBIA

FACULTY	**AGRICULTURE, ENGINEERING AND NATURAL SCIENCES**
SCHOOL	**SCIENCE**
DEPARTMENT	**ENVIRONMENTAL SCIENCE**
SUBJECT	**ECOLOGICAL FIELD TECHNIQUES**
SUBJECT CODE	**EBL3632**
DATE	**NOVEMBER 2021**
DURATION	**3 hours**
MARKS	**120**

SUPPLEMENTARY/SPECIAL EXAMINATION:

Examiners: Dr C. Hay (University of Namibia)

Dr L. Hart (University of Namibia)

Moderator: Prof C.T. Downs (University of KwaZulu-Natal)

This examination paper consists of 4 pages (including the front page)

Instructions

- Answer all questions from Section A (Total 90 marks)
- Answer only 1 question from Section B. (Total 30 marks)
- The use of scientific calculators is allowed

SECTION A

Answer **ALL** questions from Section A.

Question 1 **[25 marks]**

1.1. How would you characterise the study area when working with small mammals? (3)

1.2. Identify five factors that can only be determined by re-trapping a bird during bird ringing (i.e. that you cannot know when you first ring the bird). (5)

1.3. How would you test for the sample and analytical variability in the aquatic environment? (4)

1.4. List the values that invertebrates have for people across the globe. (5)

1.5. Explain the difference between a biological population and a statistical population. (4)

1.6. What are the criteria for aquatic plants to be used as indicator species? (4)

Question 2 **[25 marks]**

2.1. Give examples of bait that can be used for trapping different invertebrates. List the invertebrates trapped for each bait type. (8)

2.2. Explain in detail the method you will use when you are tasked to sample terrestrial vegetation to calculate the plant density where the dominant plants are large shrubs or trees and are all widely spaced. (14)

2.3. Name any three of the four major classes of ultrasonic detectors for bats. (3)

Question 3 **[40 marks]**

3.1. Explain the use of chemical solutions to sample soil invertebrates and highlight the negative aspects of using this method. (15)

3.2. As a researcher, you are tasked with surveying large mammal diversity at Daan Viljoen Game Reserve using camera traps. Briefly discuss your methods, considerations and camera settings when setting up the camera traps. (10)

3.3. What colour marker would you use to study the following species and why? Your choice must meet the criteria of the study. (5)

a) Long term monitoring of invasive Mallard Ducks at Lake Oanob. (2)

b) Temporary marking of nestling Spurfowl to determine juvenile survival. (2)

c) How may the method selected in 'question b' for juvenile Spurfowl impact the results of the study? (1)

3.4. Tabulate any FOUR properties of radio telemetry and GPS GSM telemetry to highlight their benefits and limitations. (10)

Sub-total marks (Section A) = 90

SECTION B

Answer only **ONE** question from Section B.

Question 1 **[30 marks]**

1.1. Describe the different marking techniques used for reptiles. (20)

1.2. Develop a list of equipment you will need to sample invertebrates in the field. (10)

Question 2 **[30 marks]**

2.1. Monthly surveys are conducted at a Brown Pelican roost to monitor their population. To improve the accuracy of their surveys, the team determine the impact of certain disturbances which flush (scare away) the birds. They identify natural disturbance, research (surveys) disturbance, and other non-research disturbances. (15)

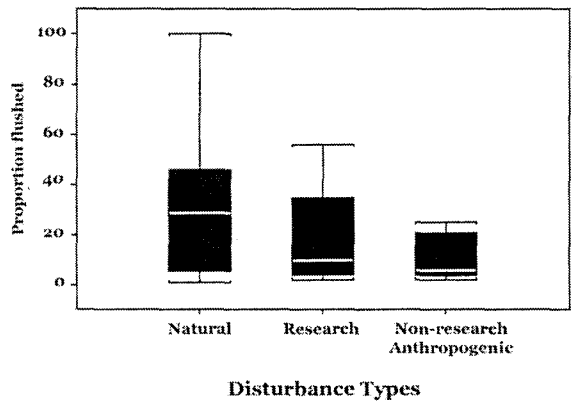

Figure 1. Disturbance types affecting Brown Pelican roost sites.

a.) Using the trends shown in Figure 1, discuss how these disturbances impact the population and provide practical solutions for how disturbance to the roost could be reduced. (10)

b.) Justify the continuation of surveys at the roost based on the data presented. (5)

2.2. Tabulate characteristics, highlighting the suitability of line or point transects with reference to bird surveys in wooded and open habitats. (15)

Sub-total marks (Section B) = 30

Grand Total Marks =120

*****END OF QUESTION PAPER *****