



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**Faculty of Health, Applied Sciences and Natural Resources**

**School of Agriculture and Natural Resources**

**Department of Natural Resources Sciences**

|  |                             |
|--|-----------------------------|
| <b>QUALIFICATION :</b> Bachelor of Natural Resource Management Honours |                             |
| <b>QUALIFICATION CODE:</b> 08BNRH                                      | <b>LEVEL:</b> 8             |
| <b>COURSE:</b> Conservation Biology                                    | <b>COURSE CODE:</b> CSB810S |
| <b>DATE:</b> June 2024   |                             |
| <b>DURATION:</b> 3 (three) hours                                       | <b>MARKS:</b> 100           |

| <b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b> |                   |
|---|-------------------|
| <b>EXAMINER(S)</b>                                  | Dr T. Nzuma       |
| <b>MODERATOR:</b>                                   | Prof. H. Ndagurwa |

| <b>INSTRUCTIONS</b>  |
|--|
| <ol style="list-style-type: none"><li>1. Answer ALL the questions.</li><li>2. Write clearly and neatly.</li><li>3. Number the answers clearly.</li></ol> |

**PERMISSIBLE MATERIALS**

1. Examination question paper
2. Answering book
3. Calculator

**THIS QUESTION PAPER CONSISTS OF 2 PAGES** (Excluding this front page)

**Question 1**

**[20]**

Provide definitions for the following terms (2 marks each):

- a) Biodiversity
- b) Conservation Biology
- c) Habitat Fragmentation
- d) Anthropocene
- e) Simpson's Diversity Index
- f) Species Richness
- g) Carrying Capacity (K)
- h) Environmental Stochasticity
- i) Extinction Vortex
- j) Island Biogeography

**Question 2**

**[30]**

- a) Explain how climate change impacts biodiversity and mention specific species affected. [10]
- b) Discuss the role of genetic diversity in conservation strategies. [10]
- c) Describe the principle of "Species-area relationships" and its importance in conservation. [10]

**Question 3**

**[25]**

- a) Calculate the Simpson's Index of Diversity for each community and show all your workings. [15]  
You are provided with the following population data for two different communities, Thorn Bushland and Mopane Woodland. Each community has a total of 300 individuals distributed among various species as follows:

- **Thorn Bushland:**
  - Species A: 70
  - Species B: 60
  - Species C: 50
  - Species D: 40
  - Species E: 30
  - Species F: 20
  - Species G: 20
  - Species H: 10
- **Mopane Woodland:**
  - Species A: 100
  - Species B: 80
  - Species C: 60

- Species D: 40
- Species E: 20

- b) Based on the Simpson's Index values calculated for Thorn Bushland and Mopane Woodland: [5]
- Interpret what the indices tell you about the biodiversity in each community.
  - Which community is more diverse and why?
- c) Considering the Simpson's Index of Diversity values you calculated: [5]
- Suggest potential management strategies that could be implemented in Mopane Woodland to increase its species diversity to levels closer to those observed in Thorn Bushland.
  - Discuss the potential benefits and challenges of your proposed strategies.

**Question 4**

[25]

Hardin proposed that controlling human population through "mutual coercion, mutually agreed upon" was essential to avoid environmental degradation. Discuss.

**THE END**

Total Marks: 100