



**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

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

| SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER | |
|--|-------------------|
| EXAMINER(S) | Dr T. Nzuma |
| MODERATOR: | Prof. H. Ndagurwa |

| INSTRUCTIONS |
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| 1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly. |

PERMISSIBLE MATERIALS

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

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

Question 1

[20]

Define and explain the significance of the following terms in the context of conservation biology (4 marks each):

- a) Ecological Succession
- b) Keystone Species
- c) Edge Effects
- d) Biological Corridor
- e) Ecosystem Services

Question 2

[30]

Given the following scenario: A national park is experiencing significant declines in its amphibian populations. The park is surrounded by agricultural land where pesticides are heavily used. Analyse the situation by answering the following:

- a) Discuss how the use of pesticides in adjacent agricultural lands could affect amphibian populations in the park. [10]

- b) Propose three management strategies that could be implemented to mitigate the impact of pesticides on these populations. [20]

Question 3

[25]

- a) Calculate the Shannon Diversity Index for both Patch A and Patch B [10]

Below is the bird species observation data for two different forest patches, Patch A and Patch B.

| Species | Patch A (Number of Individuals) | Patch B (Number of Individuals) |
|------------|---------------------------------|---------------------------------|
| Species 1 | 50 | 160 |
| Species 2 | 50 | 80 |
| Species 3 | 50 | 60 |
| Species 4 | 50 | 40 |
| Species 5 | 50 | 30 |
| Species 6 | 50 | 30 |
| Species 7 | 50 | 0 |
| Species 8 | 50 | 0 |
| Species 9 | 50 | 0 |
| Species 10 | 50 | 0 |

- b) Based on the Shannon Diversity Indices calculated for Patch A and Patch B, interpret what these indices tell you about the biodiversity in each forest patch. Discuss which patch is more diverse and why this might be significant for the ecosystem. [5]
- c) Propose at least two management strategies that could be implemented in Patch B to increase its species diversity to levels closer to those observed in Patch A. Discuss the potential benefits and challenges associated with these strategies. [10]

Question 4

[25]

Discuss the concept of "Resilience Theory" in conservation biology. In your essay, cover the following points:

- a) Define resilience as it applies to ecological systems. [5]
- b) Explain how resilience theory can guide conservation efforts. [10]
- c) Provide a real-world example of a conservation strategy that utilizes resilience theory. [10]

THE END

Total Marks: 100