

**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

SCHOOL OF AGRICULTURE AND NATURAL RESOURCE SCIENCES

DEPARTMENT OF NATURAL RESOURCES SCIENCES

QUALIFICATION: BACHELOR OF NATURAL RESOURCES MANAGEMENT	
QUALIFICATION CODE: 07BNRS	LEVEL: 7
COURSE CODE: CSE511S	COURSE NAME: CONSERVATION ECOLOGY 1
DATE: JULY 2023	
DURATION: 3 HOURS	MARKS: 150

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Prof. T.D. Wassenaar, Mr. J. Amutenya and Mrs. C Ntesa
MODERATOR:	Mr. H. Tjikurunda

INSTRUCTIONS
<ol style="list-style-type: none">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 3 PAGES (Excluding this front page)

QUESTION 1

Write short notes to define or explain the following scientific terms:

- 1.1 Aquifer (1)
 - 1.2 Inter-tropical convergence zone (1)
 - 1.3 Competition (1)
 - 1.4 Mutualism (1)
 - 1.5 Ecological niche (1)
 - 1.6 Ecological disturbance (1)
 - 1.7 Keystone (2)
 - 1.8 Ecosystem (1)
 - 1.9 Retranslocation (2)
- [11]

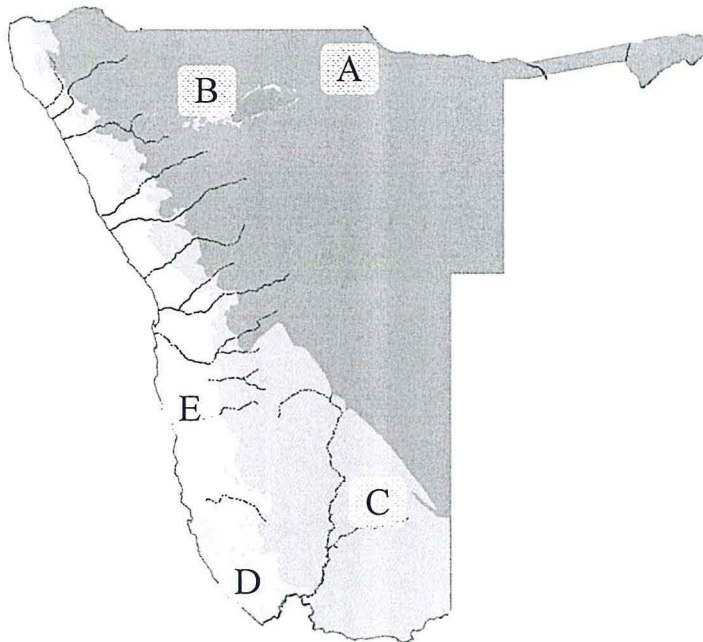
QUESTION 2

Explain the difference between the following pairs of terms.

- 2.1 Population size vs. Population density (2)
 - 2.2 Specialist species vs. Generalist species (2)
 - 2.3 Holoparasites vs. Hemiparasites (2)
 - 2.4 Bottom-up vs. Top-down Trophic cascade (2)
 - 2.5 Resistance vs. Resilience (2)
 - 2.6 Primary productivity vs. Secondary productivity (2)
- [12]

QUESTION 3

- 3.1 This is a map of the biomes of Namibia. **Name** them. (5)



- 3.2 Which one of the earth's four spheres is not involved in the cycling of phosphorus? (1)
- 3.3 What are the main factors that influence soil formation? (4)
- 3.4 (a) Define (i) coastal upwelling and (ii) subtropical high pressure system (4). (8)
(b) Explain how the Benguela upwelling and the subtropical high pressure system that lies over Namibia leads to the occurrence of the Namib Desert on our coast (4).

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QUESTION 4

- 4.1. One of the possible outcomes of interspecific competition is resource partitioning. (6)
Explain resource partitioning using relevant examples and ecological terms.
- 4.2. *List* the three common forms of exploitative interactions. (3)
- 4.3. *What* is a common characteristic of all forms of exploitative interactions? (1)
- 4.4. Predation is one of the forms of exploitative interactions, involving predator and prey species and it can affect the abundance of the prey population, serve as agents of natural selection and influence the evolution of both predator and prey. However, prey species have evolved a wide range of characteristics to avoid being detected, selected, and captured by predators. These are categorized as either chemical or behavioural defenses. *List* and *explain* any five (5) behavioural predator defense mechanisms that we discussed in class. (10)

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QUESTION 5

- 5.1. A population structure of any mammal species is characterized/defined by various factors. (10)
List and *explain* the five factors that we discussed in class.
- 5.2. Based on studies of survival by a wide variety of organisms, Population Ecologists have proposed that most survivorship curves fall into three major categories. (5)
Provide five reasons why survivorship curves are important.
- 5.3. Population growth is illustrated by population growth curves that are used to describe growth patterns. These are namely, exponential and logistic growth patterns. *Explain* why the logistic growth curve/model is more suitable/realistic to describe population growth than the exponential growth curve/model? (2)
- 5.4. Briefly *discuss* how intraspecific competition results in an inverse relationship between population density and individual growth. (4)
- 5.5. There are two main life history concepts. *Fill* in the missing words: (4)
There is a (a) _____ between the (b) _____ of offspring and their number.
When adults live (c) _____ lives, they tend to put less effort into (d) _____.

[25]

QUESTION 6

- 6.1. Almost all levels of organisation in ecology share a set of properties. *List* those properties. (3)
- 6.2. You have been introduced to, two indices that are used to measure species diversity in a community, namely, Simpson's Diversity (D) and Shannon-Wiener Diversity (H). Briefly *explain* the differences between the two indices using a table. (6)
- 6.3. Body size is one of the key factors that shape and affect community organisations. *Provide* four reasons how body size of an organism can shape and affect community organisations. (4)
- 6.4. African savannas are complex systems, however, they are prone to disturbances. (4)

Name four different anthropogenic disturbances that can affect the structure of a community.

- 6.5. **Name** and **explain** the two successional stages. (6)
[23]

QUESTION 7

- 7.1. **List** the two main processes that drive the dynamics of any ecosystem. (2)
- 7.2. **Explain** two (2) factors that influence primary production in an aquatic ecosystem. (4)
- 7.3. Decomposition is a complex process that recycles essential elements to the ecosystem. **List** the four stages of the decomposition process (in order). (4)
- 7.4. **Explain** the two main differences between a grazing food chain and a detritus food chain. (4)
- 7.5. **What** is the main link between the grazing food chain and the detritus food chain? (2)
[16]

QUESTION 8

- 8.1. Landscape ecology is the study of the reciprocal effects of patterns on the process: how landscape patterns influence ecological processes, and how those ecological processes, in turn, modify landscape patterns. **Expand** on the processes that shape landscape patterns. (5)
- 8.2. Landscape connectivity is defined as the degree to which a landscape facilitates or impedes the movement of organisms among patches through corridors. **What** are the advantages and disadvantages of connectivity between patches? (8)
- 8.3. **How** do metapopulation dynamics differ from normal population dynamics? (2)
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QUESTION 9

- 9.1. **Describe** how the theory of island biogeography may come in handy when making decisions about a protected area or any similar landscape where the protection of biodiversity is a key target. (3)
- 9.2. (a) **Fill** in the missing word: "Recent climate warming has altered the _____ of plant and animal species (1).
(b) **Give** two examples of the phenomenon described in Question (a), **explaining** how it happened (4).
- 9.3. **Define** biotic homogenization, and **explain** how this leads to a decline in biodiversity. (2)
[10]

TOTAL: 150 marks