NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCE SCIENCES

QUALIFICATION: BACHELOR OF NATURAL RESOURCE MANAGEMENT	
QUALIFICATION CODE: 07BNRS	**LEVEL:** 5
COURSE CODE: CSE511S	**COURSE NAME:** CONSERVATION ECOLOGY 1
SESSION: JULY 2022	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 150

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

INSTRUCTIONS

1. Answer ALL ten (10) questions.
2. Read all questions carefully before answering.
3. Number your answers clearly.
4. Make sure your student number appears on the answering script.

PERMISSIBLE MATERIALS

None

THIS QUESTION PAPER CONSISTS OF 4 PAGES (Excluding this front page)

QUESTION 1

Write short notes to define or explain the following:

1.1.	Biosphere	(1)
1.2.	Flora	(1)
1.3.	Homeostasis	(1)
1.4.	Competition	(1)
1.5.	Mutualism	(1)
1.6.	Metapopulation	(1)
1.7.	Nutrient cycling	(1)
1.8.	Ecological community	(1)
1.9.	Ecological disturbance	(1)
1.10.	Corridors	(1)

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QUESTION 2

***Explain* the difference between the following pairs of terms.**

2.1.	Interspecific competition vs. Intraspecific competition.	(2)
2.2.	Gross Primary Production (GPP) vs. Net Primary Production (NPP).	(2)
2.3.	Autotrophs and Heterotrophs.	(2)
2.4.	Detritivores vs. Decomposers.	(2)
2.5.	Allogenic environmental engineers vs. Autogenic environmental engineers.	(2)

[10]

QUESTION 3

Match definitions or examples with correct words (just write the number and alphabet e.g. 1c).

Definitions or examples	Words
1. The environmental factors that support (and influence) the growth, survival and reproduction of a species. 2. Species that create, modify and maintain habitats, by shaping the habitat to their own needs, subsequently altering the availability of microhabitats, food, water, sunlight and shelter for other species, thus making other species' existence possible in a community. 3. A hypothesis that predicts that local species diversity is maximized when an ecological disturbance is neither too rare nor too frequent. 4. The sequence of events related to survival and	a) Life Histories b) Mortality curves c) Intermediate Disturbance Hypothesis d) Ecosystem engineers e) Ecological succession f) Landscape connectivity g) Colonization h) Ecosystem engineers i) Natural selection j) Ecological niche k) Keystone species l) Mortality curves

reproduction that occur from birth through death. 5. A type of survivorship curve in which individuals tend to live out their physiological life span, produce few offspring but provide extensive parental care. 6. A species whose geographic distribution is limited to a specific area or spatial unit (such as a country or a biome). 7. A process in which individual organisms or phenotypes that possess favourable traits are more likely to survive and reproduce. 8. The process of change in the species structure of an ecological community over time. 9. The number of individuals per unit area. 10. The degree to which the landscape facilitates or impedes the movement of organisms among patches.	m) Endemic species n) Dispersal o) Population size p) Ubiquitous species q) Evolution r) Type III s) Population density t) Type I

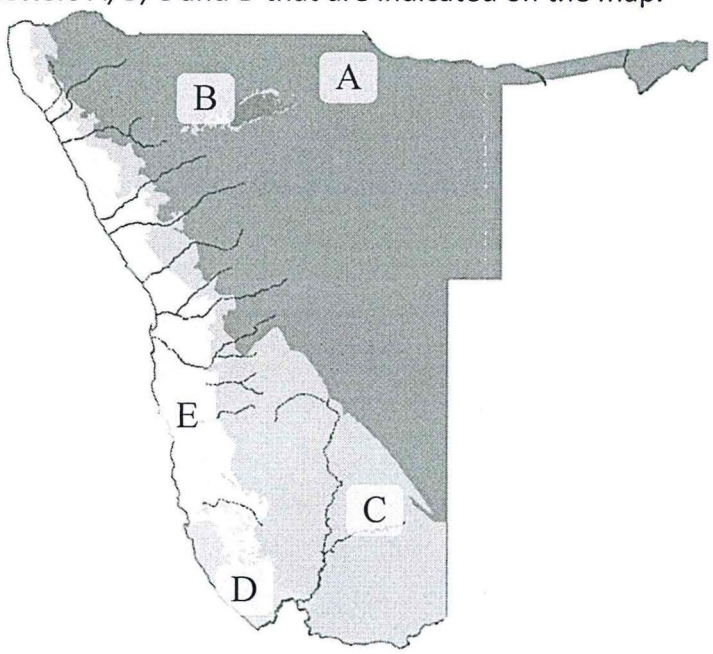
[10]

QUESTION 4

4.1. ***List*** the four spheres that make up the Earth System (do not include the Anthroposphere). (4)

4.2. ***Which*** four biogeochemical cycles are important for ecology? (4)

4.3. This is a map of the biomes of Namibia. ***Name*** them by matching with the letters A, B, C and D that are indicated on the map. (5)



4.4. ***Define*** what a key concept "aquifer" means. (1)

4.5. From an ecological perspective, we can divide groundwater/aquifers into two forms/types, namely the relatively shallow alluvial aquifers (usually in ephemeral drainages and rivers, but also sandy substrates outside rivers), and the deep aquifers in various fractured or porous rock types. Of these two types of aquifers, ***which*** one is the most important for ecology and ***why***? (3)

4.6. ***What*** are the main factors that influence soil formation? (4)

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QUESTION 5

5.1. One of the possible outcomes of interspecific competition is resource partitioning. ***Explain*** resource partitioning using relevant examples and ecological terms. (6)

5.2. ***Define*** the term mutualism and ***provide*** three examples of mutualist relationships that exist in nature. (4)

5.3. The term ecological niche has three distinct meanings among scientists, each with an associated conceptual basis. ***Name*** and ***explain*** these three distinct meanings. (6)

5.4. ***Distinguish*** between fundamental niche and realised niche. (2)

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QUESTION 6

6.1. Population dynamics of any species are concerned with the factors that influence the expansion, decline, and maintenance of populations. ***Discuss*** the four primary factors that drive population dynamics in nature. (8)

6.2. Population growth is illustrated by the population growth curve that is used to describe growth patterns. These are namely, exponential growth patterns and logistic growth patterns. ***Why*** is the logistic growth curve/model more suitable/realistic to describe population growth than the exponential growth curve/model? (2)

6.3. ***What*** are survivorship curves and ***why*** are they important? (5)

6.4. ***Discuss*** how plant populations are different from animal populations and what the implications are for the study of population structure and dynamics. (5)

[20]

QUESTION 7

7.1. 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)

7.2. ***Distinguish*** between Top-down and Bottom-up population control and provide an example for each? (4)

7.3. **Name** and **explain** five factors that affect community organisation. (10)

[20]

QUESTION 8

8.1. ***List*** and ***explain*** three limiting factors for primary production in a terrestrial ecosystem. Focus on bottom-up controls of primary production only. (6)

8.2. ***Discuss*** the process of nutrient cycling within a terrestrial ecosystem. In your explanation, use the essential element nitrogen as an example. (9)

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QUESTION 9

9.1. 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. ***Briefly expand*** on the processes that shape landscape patterns. (10)

9.2. ***Explain*** the three levels of dispersal among patches? (6)

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QUESTION 10

10.1. ***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)

10.2. ***Name*** seven recent trends in biodiversity. (7)

[10]

TOTAL: 150 marks