nAmIBIA UnIVERSITY
OF SCIEnCE AnD TECHnOLOGY

Faculty of Natural Resources and Spatial Sciences

Department Natural Resources and Agricultural Sciences

QUALIFICATION : Bachelor of Natural Resource Management Honours (Nature Conservation)	
QUALIFICATION CODE: 08BHNC	LEVEL: 8
COURSE: Conservation Biology	COURSE CODE: CSB810S
DATE: June 2019	SESSION:
DURATION: 3 (three) hours	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Mr T. Nzuma
MODERATOR:	Prof. I. Mapaure

THIS QUESTION PAPER CONSISTS OF 3 PAGES
(Excluding this front page)

INSTRUCTIONS

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

PERMISSIBLE MATERIALS

1. Examination paper.
2. Examination script.
3. Calculator.

Question 1   **[20]**

Define the following ecological terms, using examples.

1.1   Resilience   [2]

1.2   Autogenic engineer   [2]

1.3   Bequest value   [2]

1.4   Allogenic engineer   [2]

1.5   Extinct   [2]

1.6   Resistance   [2]

1.7   Edge effect   [2]

1.8   Extirpation   [2]

1.9   Commons   [2]

1.10   Tragedy of the Commons   [2]

Question 2   **[20]**

2.1   What are some of the general concerns with ex-situ conservation approach regardless of which
        species are involved?   [14]

2.2   List and explain three stochastic processes that affect small populations   [6]

Question 3   **[20]**

3.1   What is a metapopulation?   [2]

3.2   Name three factors that affect the extinction rate of metapopulations.   [3]

3.3   Estimate the percentage change from the initial abundance for the metapopulation and
        Populations 0, 3, 6, 18, and 19 in Table 1 below.   [10]

Table 1. Average abundance for some spotted owl populations.

Time	Average Abundance of each Population				
	Pop 0	Pop 3	Pop 6	Pop 18	Pop 19
0	824	4	56	22	14
5	327	2	43	8	7
10	72	1	5	3.4	3.1
15	49	0.6	1.72	1.29	1.4
20	18	0.37	0.64	0.56	0.45
% Change					

3.4   What is expected to happen to the spotted owl metapopulation if it is allowed to exist with the survival, fecundity, and dispersal values used in this model? Be specific.   [5]

3.5   In this metapopulation model, do all populations show the same trend in abundance over time? Explain why this is so.   [5]

Question 4   [40]

4.1   Diversity indices provide important information about rarity and commonness of species in a community. The ability to quantify diversity in this way is an important tool for biologists trying to understand community structure. Using the data below sampled from the Namib desert margin and the Kuiseb river;

Species	dune crest	dune swale	riverine edge	riverine centre	gravel plain
Zophosis orbicularis	3	1	16	6	0
Cheroides spp.	2	0	1	1	16
Gonocephalum spp.	0	0	77	39	0
Branchinotogluma sandersi	0	0	0	4	1
Himatismus spp.	0	0	6	0	0
Lepidonotopodium piscesae	0	0	0	2	3
Stips stali	3	0	13	34	0
Paralvinella pandorae	1	1	2	4	0
Physadesmia globosa	1	1	11	0	7
Amphisamytha galapagensis	0	0	0	14	0
Gonocephalum spp.	0	0	15	2	5
Depressigyra globulus	0	0	9	0	0
Onymacris laeviceps	0	0	22	9	0
Physadesmia spp.	0	3	3	21	45

a. Calculate species richness for each of the five habitats.   [5]
b. Calculate species diversity using Simpson's diversity index for each of the 5 habitats. Show all your calculations and interpret your findings giving one possible ecological reason for the differences in diversity.

[35]

3

THE END

Total Marks: 100