



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, APPLIED SCIENCE AND NATURAL RESOURCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

QUALIFICATION: Bachelor of Science in Agriculture	
QUALIFICATION CODE: 07BAGA	LEVEL: NQF Level 7
COURSE: Agroecology	COURSE CODE: AGE721S
DATE: November 2022	
DURATION: 3 Hours	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S):	Mr C. L. Akashambatwa
MODERATOR:	Mrs. A. Lilungwe

**THIS QUESTION PAPER CONSISTS OF 4 PAGES
(INCLUDING 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

- 1.1. One of the Main resources on earth is natural resources, fully describe it and further explain its diverse [8]
- 1.2. One of Namibia's top contributors to the GDP is sourced from Non-renewable natural resources, indicate what resources are these, furthermore, explain if this scenario is sustainably sound for the country or not. [4]
- 1.3. Artificial infrastructures such as borehole, canals and fences are a major environmental degradation causer. Elaborate more on this issue [10]
- 1.4. One of the solutions to overcome habitat fragmentation is through implementation of TFCs. Explain what TFCs are, and give a real example of this, which Namibia is part of and how it works, in terms of ecology [10]
- 1.5. You are contracted by Ministry of Environment, Forestry and Tourism (MEFT) to conduct a game census in the Bwabwata national park (West Zambezi region) park. Indicate the method you will implement for this task and explain why. [4]
- 1.6. Discuss the role of Namibian conservancies in improving agroecosystems. [10]
- 1.7. In your own words, distinguish between permaculture and organic farming [4]
- (50)

Question 2

- 2.1. Identify and explain the main benefits of permaculture [8]
- 2.2. Given the slow adoption of permaculture by various communities in the country, what do you think are some of the reasons for such a situation? elaborate on your reasons [6]
- 2.3. Suggest the missing management approaches to land use in Table below. [10]

Problem (symptom)	Common solution	Eco-friendly solution
Lowering ground water	A)	Harvest rainwater to store in sand dams and reduce consumption, e.g. by converting to wild animals that need less water than cattle
Outbreak of pests	Poison the pests	B)

Outbreak of weeds	Plough weeds into the soil or poison with herbicide	C)
Outbreak of livestock diseases	D)	Convert to wild animals that are resistant to these diseases
Poor soil structure	Plough	E)
Salinisation	F)	Minimise soil evaporation through mulch and underground irrigation
Reduced availability of firewood	G)	Convert to solar energy, encourage and plant more trees
Reduced availability of wood for fencing	H)	Convert to living fences
Reduced availability of wood for building	Convert to imported building materials	I)
High labour costs	Mechanise	J)

2.4. Name and describe the Permaculture principals with relation to sustainable land management and property design? **[16]**

(42)

Question 3

3.1 Suppose that during a 24hr waterhole count you recorded 58 elands. Their drinking frequency is 0.55 times per day. Estimate the number of elands that make use of that waterhole **[2]**

3.2. Suppose that an ecologist wants to estimate the population of elephant shrews in an area of 100m². Captured and marked individuals = 35. Recapture = 40. Recaptured individuals not marked = 15

(a) Estimate the population size? **[2]**

(b) Calculate the population density [2]

3.3 Suppose you record 50 bird calls along a route of your daily walk in a park. Then you harvest 20 birds from the park. Next day you repeat the census in the same way, this time you record 25 calls.

(a) Estimate the number of birds there were in the park before you harvest 20? [2]

(b) Estimate the current number of birds remaining in the park? [2]

(10)

TOTAL MARKS [100]