



**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 Agriculture	
QUALIFICATION CODE: 07 BAGR	LEVEL: NQF Level 7
COURSE: Rangeland Ecology	COURSE CODE: RGE520S
DATE: January 2023	SESSION: January 2023
DURATION: 3 Hours	MARKS: 100

SECOND OPPORTUNITY EXAMINATION

EXAMINER: Angela Lilungwe

MODERATOR: Dr Hilma Amwele

THIS QUESTION PAPER CONSISTS OF 5 PAGES
(Including this front page)

INSTRUCTIONS

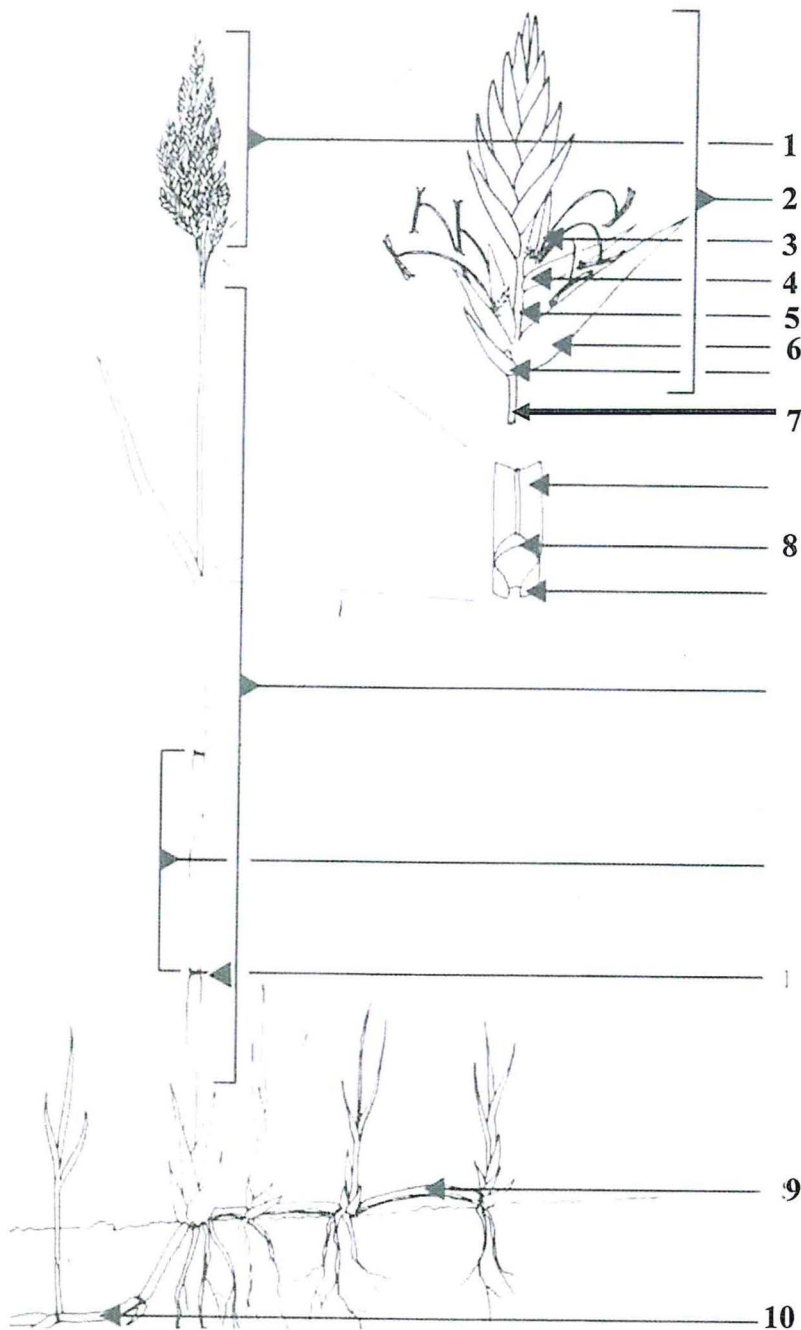
1. Answer all the questions.
2. Show clearly all the steps used in any calculations, and units alongside numbers.
3. Failure to follow instructions may result in deduction of marks.

PERMISSIBLE MATERIALS FOR STUDENTS

1. Scientific calculator.

Question 1

Label the numbered plant parts in the figure below, by writing down each number and alongside it writing the name of the corresponding plant part. [10]



Question 2

On the excursion to farm Krumhuk you followed a cow and recorded bites of what it preferred eating from the rangeland. Write down the formula to calculate the preference index?

[2]

Question 3

Discuss how the following factors influences the growth processes of plants.

- 3.1 Grazing [3]
- 3.2 Rest [3]
- 3.3 Establishment of seedlings [3]
- 3.4 Trampling on the soil [3]
- 3.5 Fire [3]

Question 4

Describe the functions and importance of grazers in nature. [12]

Question 5

- 5.1 Which out of annual and perennial plants are generally better for livestock, and why? (3)
 - 5.2 Which out of annual and perennial plants are generally better for health of the rangeland, and why? (3)
 - 5.3 Which out of annual and perennial plants are best adapted to cope with harsh conditions, and why? (3)
- [9]

Question 6

Name an example of an animal species for each of the following:

- 6.1 A domestic animal that is a selective browser (1)
 - 6.2 A domestic animal that is a selective grazer (1)
 - 6.3 A domestic animal that is a bulk grazer (1)
 - 6.4 A wild animal that is a bulk grazer (1)
 - 6.5 A wild animal that is a bulk browser (1)
- [5]

Question 7

The influence that the tool of trampling, followed by rest, has on the condition of the rangeland depends largely on the season and the texture of the soil. Explain the differences in response to trampling in the growing season and dry season between sandy and loamy soils, and recommend which soil should rather be trampled more in which season.

[10]

Question 8

Copy down the table below except for the contents of the second column, and then rearrange the contents of the second column so that the most appropriate indicator fits in the same row alongside the process which is most likely to have taken place.

[8]

Process likely to have taken place	Indicator
Sheet erosion	Coppice dunes
Gully erosion	Large areas of soil capping
Wind erosion	Pedestals
Fire	The only <i>Boscia albitrunca</i> plants are tall trees
A succession of good rainy seasons	Lack of mulch cover over the soil
Many years of excessive browsing	A low decreaser:increaser ratio
Overgrazing	A high density of <i>Acacia mellifera</i> seedlings
Continuous selective grazing	Exposed roots on one side of a large tree

Question 9

Describe the characteristics of a sweetveld?

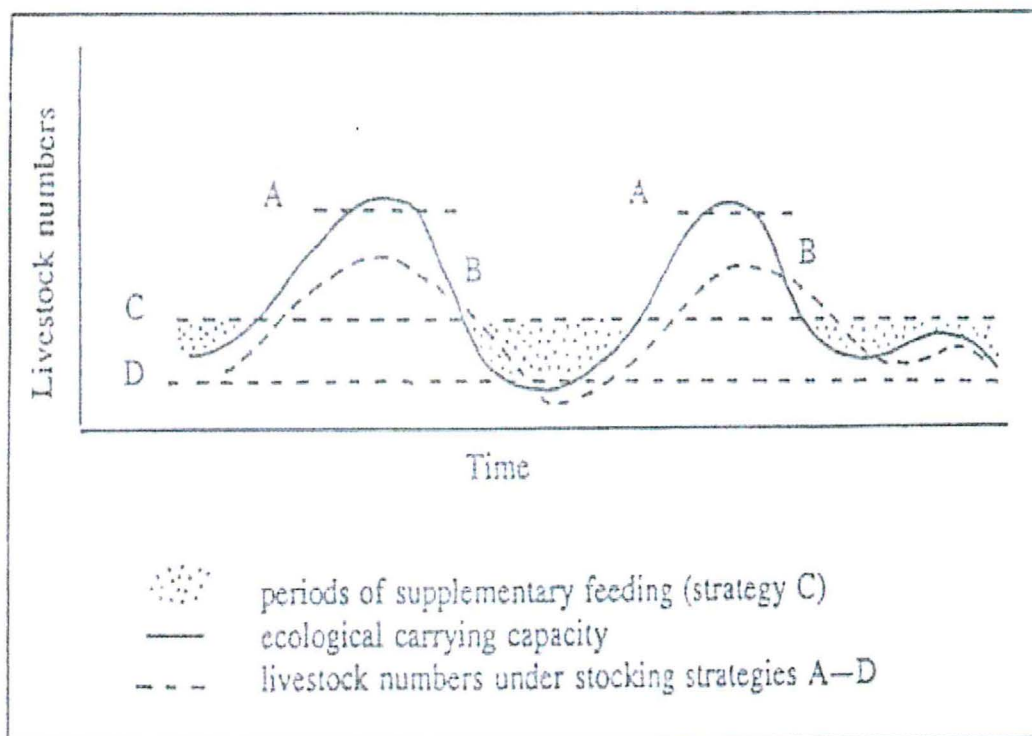
[5]

Question 10

Different farmers may use different strategies to cope with changing rainfall over the years. Describe each of the four strategies marked A-D in the diagram below and explain the major contrasting implications of each.

[12

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Question 11

- 11.1 Convert 340 SSU into LSU. (1)
- 11.2 Convert 20 ha/LSU into kg liveweight/ha. (1)
- 11.3 Convert 30 kg liveweight/ha into ha/LSU. (1)
- 11.4 Suppose a farmer wants to graze his 146 LSU on a paddock of 520 ha during the dry season. He estimates that one LSUday requires the amount of rangeland in a representative square of 23m x 23m. For how many days can the paddock be grazed? (3)
- 11.5 Suppose a farmer wants to graze a paddock of 260 ha for 30 days. He estimates that one LSUday requires the amount of rangeland in a representative square of 28m x 28m. How many LSU can be stocked? (3)
- 11.6 Suppose a paddock of 370 ha is stocked at 16 ha/LSU for 60 days. What will be the length of the side of a square that represents the amount of rangeland available for one LSUday? (3)

[12]

Total Marks 100
END