NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Natural Resources and Spatial Sciences

Agriculture and Natural Resource Sciences

QUALIFICATION: Bachelor of Agriculture	
QUALIFICATION CODE: 07BAGR	**LEVEL: 7**
COURSE: Rangeland Management	**COURSE CODE: RMN610S**
DATE: July 2019	**SESSION:**
DURATION:	**MARKS: 100**

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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THIS EXAMINATION QUESTION PAPER CONSISTS OF 5 PAGES
(Excluding this front page)

INSTRUCTIONS

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

PERMISSIBLE MATERIALS FOR STUDENTS

1. Calculator.

Question 1

Copy down the left-hand column appearing below. Then rearrange the species of the right-hand column to correspond with the relevant description from the left-hand column (each species should only appear once in your list):

Palatable perennial grass	*Acacia erioloba*
Xerophytic perennial grass	*Acacia karroo*
Palatable annual grass	*Acacia mellifera*
Xerophytic annual grass	*Anthephora pubescens*
Annual forb	*Ehretia rigida*
Sedge	*Kylinga alba*
Bush that is often heavily browsed	*Pogonarthria fleckii*
Encroacher bush	*Stipagrostis uniplumis*
Tree with large palatable pods	*Tribulus terrestris*
Tree that grows along water courses	*Urochloa brachyura*

[10]

Question 2

Holistic management provides long rest with short grazing periods, whereas the grazing strategy of Riaan Dames provides long rest with long grazing periods. Explain the differences between the effects of these two grazing strategies on each of the following:

2.1 The abundance of dense patches of annual grasses (5)

2.2 The vigour of perennial grasses (5)

2.3 The growth rate of cattle (5)

[15]

Question 3

Resting of rangelands can be achieved by herding or fencing.

3.1 Briefly explain the relative advantages and disadvantages of each (5)

3.2 Suggest two ways whereby you could lobby for the use of herding to be promoted. (4)

[9]

Question 4

Suppose a farmer with rangeland of 4000ha estimates at the end of the growing season that a representative square with sides of 29m is required by one LSUday and that the dry season will last for 210 days

4.1 Estimate the grazing capacity? (4)

4.2 Determine the number of LSU that the farmer should stock? (4)

[8]

Question 5

Suppose that during a drought, grass species A is found to have died in both the benchmark and the continuously grazed surroundings, grass species B is found to have died out in the surroundings but survived in the benchmark, and grass species C is still alive in both the benchmark and the surroundings.

Use a table like that below to indicate, for each of the three grass species in the above scenario, the type of species it is (3), and the reasons why you consider it to be this type of species (3).

Grass species	**Type of grass**	**Explanation for the conclusion**
A		
B		
C		

Then explain what this tells you about the condition of the rangeland (2) and its management potential (2).

[10]

Question 6

Name any five (5) fodder plants grown in Namibia for livestock production [5]

Question 7

The abundance of plants of a particular type or species can be a useful measure when determining rangeland condition. However there are different types of abundance and in the course of Rangeland Management you learnt about five of them. Copy down the table below and in it name each of these five types of abundance, together with an example of the units in which each may be expressed.

Type of abundance	**Example of units in which the abundance is expressed**

[10]

Question 8

Suppose that a farmer in the Camelthorn savanna has a paddock of 120ha that has been badly encroached by bushes. The paddock has been stocked at its grazing capacity of 20ha/LSU. The main encroacher species are *Acacia mellifera* (AMEL) and *Dichrostachys cinerea* (DCIN) at densities shown in Table 2 below. The farmer asks your advice on a treatment option, the treatment option is to apply Molopo arboricide to the 80% of bushes that have no palatable bush species growing nearby. You know that 20kg of Molopo costs N$2000 and gets applied at dosage rates that are also shown in the Table 2:

Table 2: Densities of different types of bushes in the 90ha paddock and arboricide dosage rates

Species and height of bush or tree	Density	Dosage of Molopo per plant
AMEL of 2m or below	2000/ha	1.5g
AMEL of more than 2m	500/ha	3g
DCIN of 2m or below	300/ha	3g
DCIN of more than 2m	100/ha	6g

Calculate the arboricide requirements appear in Table 2 above, based on needing to kill 80% of the bushes? [10]

Question 9

Benchmarks are areas where the land is in its most healthy condition. Explain the usefulness of benchmark sites [6]

Question 10

The division of a grass species into decreasers and the different types of increasers is specific to any area. With reference to some of the grass species from Waterberg, based on information contained in an old table kindly provided by Dr. Jankowitz.

Copy down the table below. Then mark with (x) the species that corresponds with the most relevant description by dividing grass species into decreaser, increaser 1,increaser 2a,increaser 2b or increaser 2c

Grass Specie	Decreaser	Increaser 1	Increaser 2a	Increaser 2b	Increaser 2c
Aristida congesta					
Eragrostis rotifer					
Urochloa brachyura					
Sporobolus paniculoides					
Anthephora pubescens					
Aristida stipitata					
Brachiaria nigropedata					
Chloris virgata					
Dactyloctinium aegyptium					
Eragrostis pallens					
Enneapogon cenchroides					
Cenchrus ciliaris					
Eragrostis tricophora					
Schmidtia pappophoroides					
Tricholaena monachne					

[15]

Question 11

Briefly describe a simple and cheap technique for each of the following:

11.1 To extinguish the flames of a mild fire in a rangeland on sandy soil. (1)

11.2 To extinguish the flames of a mild fire in a rangeland on loamy soil. (1)

[2]