NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE IN AGRICULTURE & BACHELOR OF HORTICULTURE	
QUALIFICATION CODE	07BAGA, 07BHOR
COURSE CODE: SSA520S	**COURSE NAME:** Soil Science
NQF LEVEL: 5	**NQF CREDITS:** 12
SESSION:	November 2022
DURATION: 3 Hours	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Mr Brian J. Mhango
MODERATOR:	Dr T. Nzuma

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

PERMISSIBLE MATERIALS

1. Examination question paper
2. Answering book
3. Scientific calculator

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

ANSWER ALL THE QUESTIONS

QUESTION 1

a) In the table below provide the % particle sizes and all applicable soil texture names.

% sand	% clay	% silt	Soil texture name
70			
	10	60	
	50		
	10		
	25		

(20)

b) With to soil colours, answer the following questions:

i. What is meant by transitional soil colour hues?

ii. Name any two transitional soil colours.

iii. How many soil colour hues are in each category of soil hues?

iv. How many soil colours are associated with a single soil colour hue, for example 7.5YR?

v. Explain the soil colour symbol 2.5YR 3/20.

(10)

[30]

QUESTION 2

Define the following soil science abbreviations or terms:

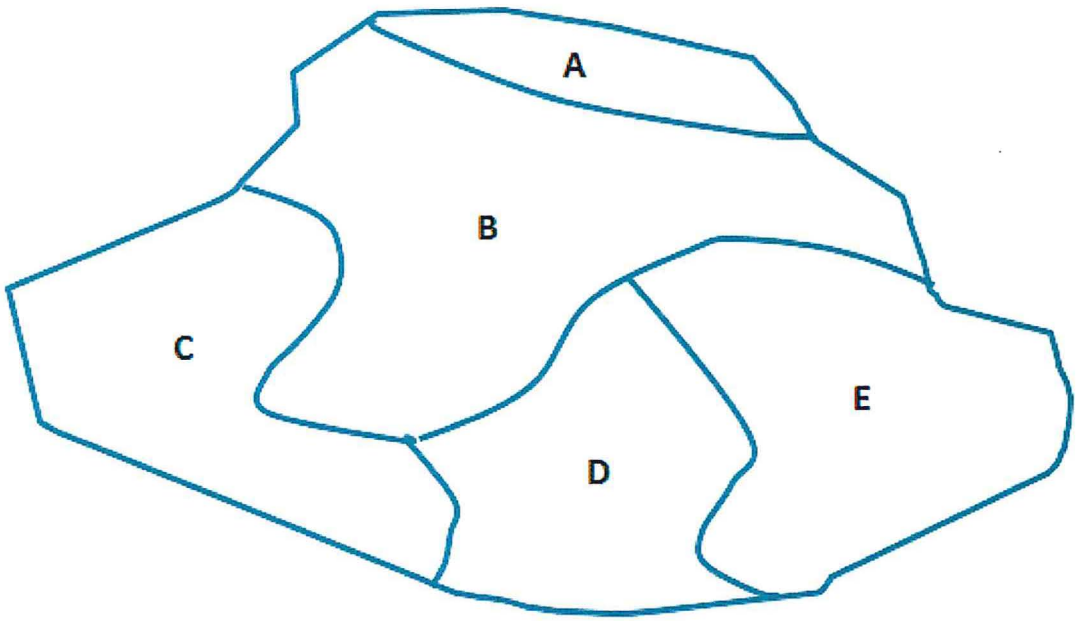
a) Sand	(2)
b) Textural triangle	(2)
c) Bulk density	(2)
d) Soil horizon	(2)
e) NPK	(2)
f) Molybdenum	(2)
g) SAR	(2)
h) Epipedon	(2)
i) pH dependent charge	(2)
j) USLE or RUSLE	(2)

[20]

QUESTION 3

Study the table and the soil map information below.

Lime Requirements to raise pH in the top 15 cm of the soil (45 kg/m^2)					
pH	Sand	Loam	Clay	Sandy Loam	Clay Loam
6.0 to 6.5	1.5	4.2	-	3.2	5.5
Sulfur Requirements to Lower pH in the 15 cm of the soil (45 kg/m^2)					
pH	Sand	Loam	Clay	Sandy Loam	Clay Loam
7.0 to 6.5	0.25	0.35	0.70	-	-



Soil Map 1: 27,400

Soil Mapping unit	Topsoil Texture	Soil pH	Area (ha)
A	Sand	7	300
B	Sandy loam	6	1000
C	Clay loam	6	750
D	Clay	7	750
E	loam	6	800

a) How many tonnes of sulfur or lime will be applied to each mapping unit to lower or raise the soil pH?

(20)

b) It is reported that all the 5 soil mapping units require units of nitrogen for fertilization (A=25 units, B=15 units, C=20 units, D=18 units and E=33 units). The brand of fertilizer available in the country is labelled 15:10:8:5. Calculate the application rates in kg/ha of this fertilizer for each soil mapping unit.

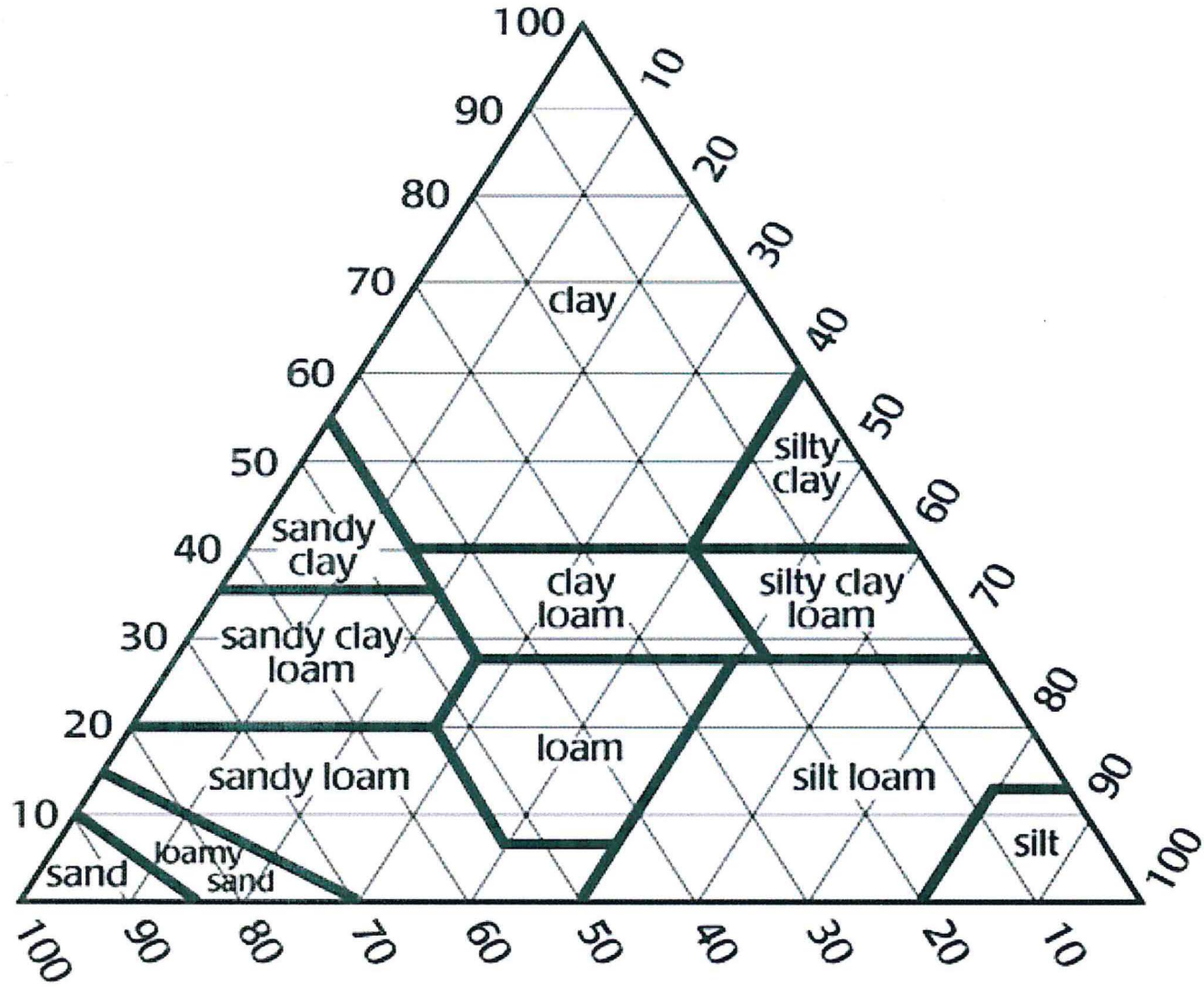
(15)

c) If the fertilizer brand in (b) above costs N$2,000 per 50kg bag, what will be the cost of each application rate per soil mapping unit?

(15)

[50]

SOIL TEXTURE TRIANGLE



THE END

Total Marks: 100