

**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF NATURAL RESOURCES AND SPATIAL SCIENCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

QUALIFICATION:	Bachelor of Agriculture		
QUALIFICATION CODE:	07BAGR		
COURSE CODE:	SSA520S	COURSE NAME:	Soil Science
NQF LEVEL:	5	NQF CREDITS:	12
SESSION:	January 2019	PAPER:	Theory
DURATION:	3 Hours	MARKS:	100

SECOND OPPORTUNITY/ SUPPLEMENTARY EXAMINATION QUESTION PAPER

EXAMINER(S):	Mr. Brian J. Mhango
MODERATOR:	Dr Fidelis Mwazi

INSTRUCTIONS

1. Please write clearly and legibly
2. Read the entire question paper before answering the questions
3. You **MUST** answer ALL QUESTIONS as directed under each section
4. Make sure your student number is on your answer sheet
5. Calculators may be used

THIS QUESTION PAPER CONSISTS OF 4 PAGES (Including this Front Page)

INSTRUCTIONS: ANSWER ALL THE QUESTIONS

[100 MARKS]

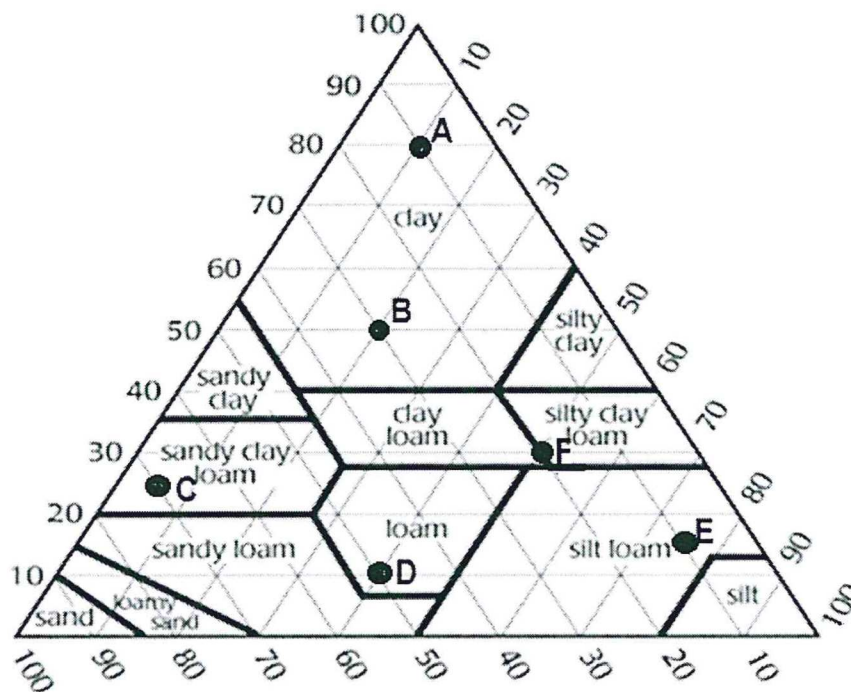
QUESTION 1

- a. With examples, explain main processes of chemical weathering of rocks. (8)
- b. Explain the classification of sedimentary rocks in relation to their particle sizes and the source material from which they are formed. (12)

[20]

QUESTION 2

- a. List key processes in soils and give an example of each process. (8)
- b. The diagram below shows the soil textural triangle used for determining soil textures. Determine the % silt, % clay and % sand of the 6 soil textures indicated by the six dots (A, B, C, D, E and F) on the triangle. Provide a table showing % silt, % clay and % sand.



[12]

[20]

QUESTION 3

A farmer has 20 hectares of agriculture land. The farmer divides the land into four five-hectare plots and wishes to grow a different crop on each plot. The farmer samples each plot for soil analysis to determine fertilization rates for optimum crop yields. Of the four crops he wishes to grow each has different requirements for N, P, K and S nutrients. The analysis of these nutrients are given in table 1 below:

Table 1: Plots N, P, K, S Analysis

Plot Number	N	P	K	S
A	NL	NL	25	NL
B	NL	NL	NL	10
C	NL	15	NL	NL
D	35	NL	NL	NL

NL = Not Limiting, numbers refer to units needed for the given nutrient for fertilizer rates of application.

Table 2: Available Fertilizer Brands in the Country.

Fertilizer Name	N (%)	P %	K%	S%
Urea	46	0	0	0
Potassium sulphate	0	0	52	12
Urea Ammonium Phosphate	27	27	0	0

(i). Based on the information in the two tables determine:

- Choice of the fertilizer(s) and required units for each plot (5)
- Fertilizer application rates in kg/ha (5)
- Amount of the nutrient to be applied in kg/ha (5)

Clearly show your calculations where applicable.

(ii). Assuming Potassium sulphate costs N\$3,000.00, Urea costs N\$2,000.00, and Urea Ammonium Phosphate N\$2,800.00 per 50kg bag, what will be the average cost of fertiliser for the four plots? (15)

[30]

QUESTION 4

- a) Identify mineral sources of plant nutrients and their classification and list any three nutrient elements from each classification and source. (15)
- b) Explain processes or steps involved in the phosphorus cycle. (15)
- [30]
-