NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES
SCHOOL OF AGRICULTURE AND NATURAL RESOURCES SCIENCES
DEPARTMENT OF AGRICULTURAL SCIENCES AND AGRIBUSINESS

QUALIFICATIONS: BACHELOR OF SCIENCE IN AGRICULTURE BACHELOR OF SCIENCE IN HORTICULTURE	
QUALIFICATIONS CODE: 07BAGA **07BHOR**	**LEVEL: 7**
COURSE CODE: SSA520S	**COURSE NAME:** SOIL SCIENCE
DATE: JANUARY 2025	**PAPER:** 2
DURATION: 3 HOURS	**MARKS:** 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER:	DR. VENAUNE HEPUTE
MODERATOR:	DR. TENDAI NZUMA

INSTRUCTIONS

1. Answer all the questions.
2. Write neatly and clearly.
3. Mark all answers clearly with their respective question numbers.
4. All written work MUST be done in blue or black ink.
5. No books, notes and other additional aids are allowed.

PERMISSIBLE MATERIALS

1. Calculator
2. Examination paper
3. Examination script

THIS QUESTION PAPER CONSISTS OF 3 PAGES
(Excluding This Front Page)

SECTION A: MULTIPLE CHOICE AND TRUE / FALSE [10 MARKS]

QUESTION 1: MULTIPLE CHOICE QUESTIONS

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Fill in the appropriate letter next to the number of the correct statement/phrase on your ANSWER SHEET. *[10 marks]*

1.

1.1. Solum is the upper part of the soil profile, which is influenced by plant roots. It consist of;
- a). Water and air only
- b). Parent material
- c). Bed Rock
- d). The A horizon and the B horizon

1.2. The following is one of the soil compaction indicator
- a). Bulk Density
- b). High rainfall
- c). Crop rotation
- d). Human

1.3. A typical healthy soil composition fraction comprises of;
- a). 45% minerals, 25% water, 25% air, and 5% organic matter content.
- b). Parent material45% minerals, 35% water, 10% air, and 10% organic matter content.
- c). Bed Rock45% minerals, 25% water, 15% air, and 15% organic matter content.
- d). 25% minerals, 45% water, 25% air, and 5% organic matter content.

1.4. What are the two examples of soil chemical properties?
- a). Soil pH and Cation Exchange Capacity
- b). Plants and humans
- c). Soil texture and soil structure
- d). Pathogen and fungi

1.5. Soil particle size diameter of clay soil texture are smaller than;
- a). 0.05mm
- b). 0.002cm
- c). 0.002mm
- d). 2.0mm

1.6. Formation of soil is the result of interaction of the following soil forming factors, namely;
- a). Parent material, Climate, Nutrients, Time and Organisms Parent
- b). Parent material, Climate, Topography, Wind and Organisms
- c). Parent material, Climate, Tractors, Time and Organisms
- d). Parent material, Climate, Topography, Time and Organisms

1.7. SOM stand for;
- a). Surface Ozone Medium
- b). Soil Organic Matter
- c). Soil Original Material
- d). Science of Meditation

1.8. SAR stand for;
a). Soil Revised Ratio
b). Sodium Adsorption Ratio
c). Sodium Amendment Returns
d). Sulphur Application Rate

1.9. The following are factors of soil physical properties
a). Soil pH, CEC, Nutrients
b). Human, Animal, Microorganisms
c). Soil Texture, Structure, Bulk density
d). Soil texture, CEC, nitrogen

1.10. The primary nutrient necessary for crop performance, growth and plant development.
a). Hydrogen, Zinc, Iron
b). Iron, Zinc, Boron
c). Magnesium, Calcium, Sulphur
d). Nitrogen, Phosphorus, Potassium

QUESTION 2: TRUE/FALSE QUESTIONS **[10 MARKS]**

Evaluate the statements and select whether the statement is true or false. Write the word 'True' or 'False' next to the corresponding number on your ANSWER SHEET. *[10 marks]*

2.

2.1 Solum consists of the surface and subsoil layers that have undergone through some soil forming conditions, A-Horizon and B-Horizon.

2.2 Vertisols are the most common popular soil order group in Namibia occupying more than 80% of land space.

2.3 Class II (2) soils have moderate limitations that reduce the choice of plants or require only moderate conservation or sustainable practices.

2.4 Soil bulk density is described as the size, shape and distinctness of soil pedons

2.5 LiDAR stands for Light Detection and Ranging.

2.6 CEC stand for Conductive Exchange Carbon.

2.7 CEC of organic matter is constant at all soil pH values.

2.8 Soil erosion is the loss of top fertile soil caused by wind only.

2.9 Soil survey is the loss of nutrients through leaching due to high rainfall

2.10 Class VIII (8) soil capability classification has no limitation and requires no conservation practices.

SECTION B: SHORT/LONG ANSWER QUESTIONS **[25 MARKS]**

Please answer ALL of the questions in this section.

QUESTION 3: TERMINOLOGIES.

3. Define and discuss the following terminologies

3.1. Soil *[4 marks]*
3.2. Soil Survey *[4 marks]*
3.3. Soil Biodeversity *[4 marks]*
3.4. Soil Mineralogy *[4 marks]*
3.5. Leaching *[4 marks]*
3.6. Land degradation *[5 marks]*

QUESTION 4: SOIL TEXTURE TRIANGLE CLASSIFICATION SYSTEM. **[20 MARKS]**

4.

4.1. List and explain the main materials and tools required for soil sample collection *[5 marks]*
4.2. Explicitly discuss the importance and benefit of soil testing and analysis on soil fertility management *[5 marks]*
4.3. In logical sequence, list all steps and technique proceducres under taken during soil sample until soil texture detirmination stage using Soil Texture Triangle Method. *[10 marks]*

QUESTION 5: SOIL CLASSIFICATION. **[30 MARKS]**

5.

5.1. List any five (5) soil orders classification group commonly found in Namibia and provide descriptive features (based on dominant structure) of the five-vegetation type found in those soil group orders and for each vegetation type indicate the dominant landscape, and specific locality in Namibia. *[15 marks]*

5.2. Briefly define and discuss the impact of the following aspects in relation to crop performance and soil fertility.

5.2.1. Soil texture physical properties *[5 marks]*
5.2.2. Soil pH *[5 marks]*
5.2.3. Cation Exchange Capacity (CEC) *[5 marks]*

QUESTION 6: SOIL ECOLOGY. **[5 MARKS]**

6.1. Explicitly discuss the following concepts;

6.1.1. Ecosystem and Soil Ecology [5]

END OF QUESTION PAPER

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QUALIFICATIONS: BACHELOR OF SCIENCE IN AGRICULTURE	
QUALIFICATIONS CODE: 07BAGA	**LEVEL: 7**
COURSE CODE: SNH611S	**COURSE NAME:** SUSTAINABLE NON-RUMINANT HUSBANDRY
DATE: JANUARY 2025	**PAPER:** 2
DURATION: 3 HOURS	**MARKS:** 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER:	DR. GABRIEL NGUNGAA HANGARA
MODERATOR:	MRS. LUCIA TUYENI-KELAO KAFIDI

INSTRUCTIONS

1. Answer all the questions.
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Question 1

Define the following terms

1.1 Omnivores (1)
1.2 Herbivores (1)
1.3 Carnivores (1)
1.4 Differentiate between fish and chicken digestive systems parts. (11)
[14]

Question 2

State whether the following diseases are Bacterial, Protozoan, or Viral diseases and give three symptoms of each.

2.1 Fowl Typhoid (4)
2.2 Avian pox (4)
2.3 Newcastle (4)
2.4 Name two different systems of broiler production and differentiate them. (8)
[20]

Question 3

3.1 Differentiate between Cestoda worms and Pintado worms. (4)
3.2 Name three distinct layers of fish skin and give one function of each layer. (6)
[10]

Question 4

4.1 Name three parts of the fish circulatory system and give three functions of each. (12)
4.2 Explain the osmoregulation of Marine and Freshwater fish. (9)
[21]

Question 5

5.1 What are the key differences between the water-based system and land-based system? (4)
5.2 Name three primary hormones involved in fish reproduction and give one function of each. (6)
[10]

Question 6

6.1 Explain what causes still birth in pigs. (8)
6.2 Give 6 methods of pregnancy diagnosis (PD) in pigs. (6)
6.3 Give three examples on how Brucellosis get transmitted. (3)
[17]

Question 7

7.1 Define the term Cuniculture. (2)
7.2 At what age do rabbits reach maturity? (2)
7.3 What is the gestation period of rabbits? (2)
7.4 When do you wean rabbit bunnies from does? (2)
[8]

Total **[100]**

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QUALIFICATIONS: BACHELOR OF SCIENCE IN AGRICULTURE	
QUALIFICATIONS CODE: 07BAGA	**LEVEL: 7**
COURSE CODE: SCP621S	**COURSE NAME:** SUSTAINABLE CROP PRODUCTION
DATE: JANUARY 2025	**PAPER:** 2
DURATION: 3 HOURS	**MARKS:** 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER:	DR. VENAUNE HEPUTE
MODERATOR:	DR. EDGARS MOWA

INSTRUCTIONS

1. Answer all the questions.
2. Write neatly and clearly.
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SECTION A: MULTIPLE CHOICE AND TRUE / FALSE [10 MARKS]

QUESTION 1: MULTIPLE CHOICE QUESTIONS

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Fill in the appropriate letter next to the number of the correct statement/phrase on your ANSWER SHEET. *[10 marks]*

1.

1.1. The following are Sustainable Crop Production pillars EXCEPT.
- a). Economic
- b). Environmental
- c). Social
- d). Educational

1.2. The following are weather, and climate elements required for optimal crop growth EXCEPT.
- a). Organic matter
- b). Rainfall
- c). Humidity
- d). Temperature

1.3. These are among horticulture crops of economic importance in Namibia.
- a). Maize, pearl millet, wheat
- b). Sesame, groundnuts, soyabeans
- c). Cabbage, tomatoes, potatoes, grapes
- d). None of the above

1.4. The typical climate requirement of pearl millet.
- a). Temperatures of around -6°C to 16°C, annual rainfall in the range of more than 600 mm
- b). Temperatures of around 13°C to 16°C, annual rainfall in the range of 450 to 1000 mm
- c). Temperatures of around 28°C to 30°C, annual rainfall in the range of 200 to 500 mm
- d). None of the above

1.5. These are among agronomy crops of economic importance in Namibia.
- a). Cabbage, lettuce,
- b). Grapes, guava, soyabeans
- c). Maize, wheat, pearl millet
- d). None of the above

1.6. These are different types of vegetable crops EXCEPT;
- a). Lettuce
- b). Cabbage
- c). Rice
- d). Tomato

1.7. The following are direct benefit of green manure.
- a). Increased pest infestation
- b). Increased nitrogen, water retention, reduced erosion
- c). Increased nitrogen, increased weed, improved spacing
- d). Pest control, reduced diseases, reduced labour and income

1.8. The benefit of crop rotation in the soil;
   a). Decrease yield
   b). Increase pest
   c). Improve soil structure, microbial activity, moisture retention
   d). Increase water run-off

1.9. Among others, the following are sustainable fertilization practices.
   a). Mulching, Green Manure, Cover Crop, Crop Rotation
   b). Integrated Pest Management, Application of herbicides
   c). Application of excessive pesticides
   d). Maximum tillage

1.10. The following factors among others influence temperature
   a). Wind, precipitation, day length, clouds
   b). Food, soil colour, birds
   c). Nutrients, people, fertilizer
   d). None of the above

QUESTION 2: TRUE/FALSE QUESTIONS **[10 MARKS]**

Evaluate the statements and select whether the statement is true or false. Write the word 'True' or 'False' next to the corresponding number on your ANSWER SHEET. *[10 marks]*

2.

2.1 Karst production zone is the top grapes producing zones in Namibia.

2.2 Low level clouds are formed at 7 km to 13 km above the ground

2.3 Weather is the short-term atmospheric conditions of any particular place.

2.4 LiDAR stands for Light Detection and Ranging.

2.5 Climate is the average of weather conditions over a long time in that specific place or space.

2.6 Weather and climate elements have vital impact on crop production.

2.7 Pearl millet is a crop within the group of oilseeds.

2.8 Cabbage is a crop among the cereal crop group type.

2.9 All agricultural practices have no contribution towards global warming neither on climate change

2.10 Sustainable crop production system does not use any fertilizer.

SECTION B: SHORT/LONG ANSWER QUESTIONS **[20 MARKS]**

Please answer ALL the questions in this section.

QUESTION 3: TERMINOLOGIES.

3. Define and discuss the following terminologies

3.1. Sustainable Crop Production *[4 marks]*

3.2. Coventional Agriculture *[4 marks]*

3.3. Intergrated Pest Management *[4 marks]*

3.4. Conservation tillage *[4 marks]*

3.5. Agro-climatology *[4 marks]*

QUESTION 4: SUSTAINABLE PRODUCTION PRACTICES **[35 MARKS]**

4.

4.1. Name and explain five (5) Factors influencing temperature. *[10 marks]*

4.2. List and explicitly discuss five (5) production practices used in sustainable crop production *[10 marks]*

4.3. Develop a sustaibale tomato crop production management program adhering to the pilars of sustainable production, illustrate at each production stage the appropriate and exact sustainable production practices to be applied, starting from land preparation till harvesting. *[10 marks]*

4.4. Name and discuss different types of tillage practices recommendable under sustainable crop production system. *[5 marks]*

QUESTION 5: SMART - PRECISION AGRICULTURE **[25 MARKS]**

5.

5.1. Define Smart Agriculture. *[5 marks]*

5.2. Briefly discuss the benefit (objectives), Disadvantages and Advantages of Smart Agriculture. *[10 marks]*

5.3. List and explain devices, tools and equipment used under smart agriculture crop production system. Illustrate at each production stage the appropriate and exact smart production tool or device used starting from land preparation till harvesting. *[10 marks]*

END OF QUESTION PAPER