NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES

QUALIFICATION: Bachelor of Agriculture	
QUALIFICATION CODE: 07BAGA	**LEVEL: 6**
COURSE CODE: GRS621S	**COURSE NAME:** Applications of GIS and Remote Sensing in Agriculture
DATE: January 2023	**PAPER:** THEORY
DURATION: 3 Hours	**MARKS:** 85

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Prof. Vera De Cauwer
MODERATOR:	Dr Jonathan Kamwi

INSTRUCTIONS
1. Write clearly and neatly. 2. Number your answers clearly. 3. Make sure your student number appears on the answering script. 4. Include the formulas used for each calculation.

PERMISSIBLE MATERIALS

1. Calculator

THIS QUESTION PAPER CONSISTS OF 3 PAGES (Including this front page)

Question 1 [4]

What is the difference between spatial and geospatial data? Explain briefly

Question 2 [16]

Convert the following coordinates to decimal format.

1. 16° 6.9' S, 23° 55.9' E
2. S 45° 45.6258', E 29° 15.5582'
3. 18° 19' 36" S, 21° 54' 2" W
4. S 28° 59', E 23° 8'

Question 3 [6]

What is the difference between vector and raster data?

Question 4 [11]

What does GPS stand for? Describe in detail what it is and how it works.

Question 5 [18]

Indicate if following statements are True or False. <u>If false, correct the statement.</u>

1. Electromagnetic radiation with a long wavelength has a low frequency.
2. A satellite image contains geospatial information in vector format.
3. Polygons are composed of at least 2 vertices that are connected.
4. Each cell of a raster image stores a single value.
5. Green plants absorb green light.
6. The location 1,215,000 m E, 581,355 m S is expressed in geographical coordinates.
7. Coordinates of latitude represent the X-axis for the grid of latitude and longitude lines covering the world.
8. You can not open a QGIS project on a computer without having the GIS data used in the project.
9. The latitude at the equator is 90°.
10. GPS data is vector data and most often in gpx format.
11. The EIS is a local data repository that contains GIS data.
12. A map scale of 1:250,000 is larger than a map scale of 1:25,000.

Question 6 [7]

Why is it important to assess the quality of GIS data? What are the key components to evaluate geospatial data quality?

Question 7 [3]

What is terrain relief? How can you display terrain relief on a map?

Question 8 [5]

What is the difference between active and passive remote sensing sensors?

Question 9 [7]

Underneath is an attribute table of a GIS layer named "vegetation".

1. How many features does the GIS layer contain?
2. List the attributes of the GIS layer.
3. QGIS uses another name for attribute, which one?
4. What is "ID" referring to? Explain.
5. Is "vegetation" a point, line or polygon layer? Why?

ID	Vegetation type	Area_km2
6	Mopane woodland	150.6
2	Riverine vegetation	2.5
3	Mountain shrub savanna	26.3
9	Bare soil – no vegetation	0.4

Question 10 [5]

a) What is a vegetation index?
b) Why are vegetation indices used?
c) Which is the most used vegetation index?

Question 11 [3]

Give the expression that shows the relation between the frequency and wavelength of electromagnetic radiation. What is this expression representing?