



**GWANDA STATE UNIVERSITY
FACULTY OF ENGINEERING AND ENVIRONMENT
DEPARTMENT OF GEOMATICS AND SURVEYING**

**INTRODUCTION TO
GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING**

LES1203

Final Examination Paper

April 2024

This examination paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: Mr A Sibanda

INSTRUCTIONS

Answer ALL questions in chronological order

QUESTION 1: Introduction to Remote Sensing (RS)			[25]
a		Define remote sensing and how is it utilised in GIS.	3
b		Explain the Difference between active and passive remote sensing systems.	6
c		What distinguishes multispectral remote-sensing images from hyperspectral remote-sensing images?	6
d		Can you give an example of how and when ground control points are used in remote sensing	5
e		State and the 3 main types of electromagnetic radiation used in remote sensing.	5
QUESTION 2: Components for Remote Sensing (RS) and Imagery Interpretation			[25]
a		Discuss the four sensor platforms	
	i)	Ground-based	3
	ii)	Aircraft	4
	iii)	Space shuttle	4
	iv)	Satellite	4
b		Describe and explain the key steps involved in the remote sensing process (Energy Flow) using the diagrams.	10
QUESTION 3: Principles of Geographic Information Systems			[25]
a		Define Geographic Information Systems (GIS) and explain its role in geography and related fields.	5
b		Briefly explain the major GIS functions.	4
c		Discuss the fundamental components of GIS and explain their significance in spatial data analysis.	5
d		Discuss the challenges and potential solutions in integrating GIS with other technologies, such as mobile devices, internet of things (IoT), and artificial intelligence (AI).	11
QUESTION 4: Geographic representations			[25]
a		What is a map projection?	2
b		Describe the process of map projection and discuss the various types of map projections commonly used in cartography.	10
c		Explain the difference between a large-scale map and a small-scale map.	3
d		What are the advantages and disadvantages of using GIS for spatial analysis?	10