GWANDA STATE UNIVERSITY

FACULTY OF ENGINEERING AND ENVIRONMENT

DEPARTMENT OF GEOMATICS AND SURVEYING

GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING
ESG1112/NGE1105

Final Examination Paper

September 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	i)	What is remote sensing?	2
		ii)	Discuss active remote sensing and passive remote sensing in brief.	4
		iii)	What is the resolution of a sensor? Describe all sensor resolutions.	10
	b	i)	What are the advantages and disadvantages of various remote sensing platforms	5
		ii)	With a neat diagram explain the spectral reflectance curves.	4
QUESTION 2: Remote Sensing Platforms and Image Processing				**[25]**
	a	i)	What are the benefits and limitations of using satellite remote sensing platforms for environmental monitoring and assessment?	5
		ii)	Explain the difference between Geostationary, Sun-synchronous and polar orbit in Remote sensing	6
		iii)	What is the difference between spectral resolution and spatial resolution?	4
		iv)	Imagine you are working for a company that specializes in using UAVs for environmental monitoring and engineering projects. You are tasked with developing a system to monitor the impact of a new highway construction project on a nearby wetland ecosystem.	10
QUESTION 3: Principles of Geographic Information Systems				**[25]**
	a	i)	What is GIS? Explain any four application areas of GIS	5
		ii)	List the functional components of GIS. Explain any two of them in detail.	5
	b		What are the different ways of capturing and preparing spatial data? Explain.	5
	c		Explain how spatial data and attribute data integrated to make a GIS	10
QUESTION 4: Geographic representations and data models				**[25]**
	a		With the aid of clear diagrams demonstrate your understanding of the following GIS data models:	
		i)	Rasta data model	5
		ii)	Vector data model	5
	b	i)	Define and explain the following terms Geoid and vertical Datum	3
		ii)	You're making a Zimbabwe map showing major mountain ranges. Which map projection, would be best for accuracy and visual appeal? Explain your choice, considering distortions and how you'd use GIS to create the map.	12

END OF EXAMINATION