



ZIMBABWE EZEKIEL GUTI UNIVERSITY

COLLEGE FOR LIFELONG LEARNING

**FACULTY OF SCIENCE, TECHNOLOGY, AGRICULTURE AND FOOD
SYSTEMS**

EXAMINATION PAPER

Diploma in Strategic Mine Safety, Health and Environment

MODULE CODE : **DSMS124**
MODULE TITLE : **GIS and Remote Sensing**
DURATION : **2 Hours**
LEVEL : **1.2**
DATE : **28 NOV 2025**

INSTRUCTIONS TO CANDIDATES:

1. No cell phones are allowed in the examination venue.
2. Answer any two (2) questions
3. The number of marks for each question or part question is shown in brackets []
4. Begin each answer on a new page.
5. **DO NOT OPEN THIS PAPER UNTIL THE INVIGILATOR INSTRUCTS YOU.**

Answer any two (2) questions

Question 1 (25 marks)

- a) Compare passive and active sensors, highlighting at least two key differences in operation and data characteristics. (10 marks)
- b) Identify the fundamental principles of cartography that should be considered when constructing a map. Explain how these principles influence map effectiveness and clarity. (15 marks)

Question 2 (25 marks)

- a) Define Spatial Analysis in GIS and explain its role in supporting decision-making. (5 marks)
- b) Describe how the main GIS components work together to facilitate spatial data analysis and informed decisions. Include the four components listed below and explain their contributions:
- i. Hardware
 - ii. Software
 - iii. Data
 - iv. People

(20 marks)

Question 3 (25 marks)

Discuss how each component of Remote Sensing contributes to the process of collecting and interpreting data from the Earth's surface. Address the seven elements below and explain their role from data acquisition to interpretation:

- i. Energy Source
- ii. Sensor
- iii. Atmospheric Interaction
- iv. Data Recording
- v. Data Transmission and Processing
- vi. Interpretation and Analysis
- vii. Applications

Question 4 (25 marks)

- a) Discuss how active sensors (LiDAR systems) generate their own energy source and the advantages this provides in terms of data acquisition compared to passive sensors. (15 marks)
- b) Explain the significance of data collection and preprocessing in the GIS process. What challenges might arise during these initial stages, and how can they impact the overall analysis? (10 marks)

THE END

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