

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE

DEPARTMENT OF GEOGRAPHY

**MASTERS OF SCIENCE DEGREE IN CLIMATE CHANGE AND
SUSTAINABLE DEVELOPMENT /**

MASTER OF SCIENCE DEGREE IN DISASTER RISK MANAGEMENT

**MCS513: GIS & REMOTE SENSING FOR CLIMATE CHANGE AND
SUSTAINABLE DEVELOPMENT /**

MDR511: GEO-INFORMATION IN DISASTERS

EXAMINATION

JUN 2023

TIME: 3 HOURS

**ANSWER ONE (1) QUESTION FROM SECTION A AND TWO (2)
QUESTIONS FROM EITHER SECTION B OR C. USE
ILLUSTRATIONS WHERE RELEVANT. MARKS FOR EACH
QUESTION ARE INDICATED IN BRACKETS [].**

Section A: ALL: Choose 1 question

1. a) Elaborate on the importance of metadata in GIS and remote sensing applications. [10]
b) i. Explain the term "atmospheric windows" as applied in remote sensing. [5]
ii) With the aid of a diagram describe the spectral signature of clear water and water with phytoplankton. [10]
2. a) Discuss the components and functionalities of a GIS. [10]
b) i) Differentiate between passive and active remote sensing. [5]
ii) Justify the satellite system that can be used to monitor a highly changing phenomenon over the whole of Southern Africa. [10]

Section B: Climate change and sustainable development: Choose 2 questions

3. Discuss the challenges and prospects in the application of GIS and Remote Sensing in climate change and sustainable development. [25]

4. With reference to climate change, motivate the application of any one change detection method in monitoring changes in vegetation cover. [25]
5. Forest fires are hazards associated with climate change. Explain how remote sensing can be used in monitoring active forest fires. [25]

Section C: Disaster Risk Management: Choose 2 questions

1. With reference to cholera as a public health disaster, explain how geospatial technology can be applied in the development and implementation of control and management strategies. [25]
2. *“Vulnerability assessments without the spatial component are not applicable in effective disaster risk reduction initiatives”*. Discuss. [25]
3. Justify the need for geospatial technology as any integral part of operational disaster risk management systems in Zimbabwe. [25]