**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE AND ENGINEERING**

**SCHOOL OF GEOSCIENCES, DISASTERS & DEVELOPMENT**

**GEOSCIENCES DEPARTMENT**

**MASTER OF SCIENCE DEGREE IN NATURAL RESOURCES MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY**

**MG509: ENVIRONMENTAL REMOTE SENSING/GEOGRAPHIC INFORMATION SYSTEMS**

**EXAMINATION** - JUN 2023 **TIME: 3 HOURS**

**ANSWER THREE QUESTIONS ONLY.USE ILLUSTRATIONS WHERE RELEVANT. MARKS FOR EACH QUESTION ARE INDICATED IN BRACKETS [ ].**

---

1. Discuss the challenges and prospects in the application of GIS and Remote Sensing in natural resources management and environmental sustainability [25]

2. a) Differentiate vector and raster data models in GIS. [5]

   b) With reference to remote sensing discuss the importance of any two of the following: i) spatial resolution, ii) temporal resolution and iii) active sensors. [10]

   c) Deliberate any five elements of visual image interpretation. [10]

3. With the aid of a labelled diagram, describe the spectral response pattern of vegetation and explain its application in vegetation monitoring. [25]

4. a) Explain differences between passive and active remote sensing. [10]

   b) Discuss the application of active remote sensing in natural resources management. [20]

5. a) With the aid of a formulae, define the term normalised difference vegetation index (NDVI). [5]

b) Describe the application of NDVI in monitoring the impact of drought in Zimbabwe. [20]

---

***END OF EXAMINATION***