BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

DEPARTMENT OF CURRICULUM and EDUCATIONAL MANAGEMENT STUDIES

JUN 2023

DIPLOMA IN SCIENCE EDUCATION IN MATHEMATICS AND GEOGRAPHY (DipScEdMG)

COURSE CODE: DG 004 (1). **COURSE NARRATION:** GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING

DURATION: 3 HOURS   **TOTAL MARKS:** 75

INSTRUCTIONS
- Answer any **three** questions.
- Each question carries 25 marks
- Use examples, illustrations and diagrams where relevant

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1. a. Discuss the major components of
   i.   A Remote Sensing System   [5]
   ii. A Geographic Information System   [5]

   b. Explain the main functional capabilities of GIS. Use examples to illustrate your answer.   [15]

2. a. Distinguish between the following
   i.   Passive remote sensing vs active remote sensing   [2]
   ii.   Sensors and platforms   [2]
   iii. Primary data vs secondary data   [2]
   iv.   Raster data model vs vector data model   [2]
   v.   Temporal resolution vs spatial resolution   [2]
   vi.   Crisp vs fuzzy boundary   [2]

   b.   i. Describe any **three** topological errors in a GIS.   [3]
         ii. Illustrate using diagrams how these topological errors can be corrected
                                                                   [6]

   c.   Given two points on the Earth surface with the following coordinates, A (4;6) and B (7;2), calculate the distance between these features [4]

3. a.   With the aid of a diagram, explain how extinction of Electromagnetic Radiation (EMR) occurs.   [12]

b. Explain the relationship between spectral reflectance and wavelengths regions shown on Figure 3. [13]
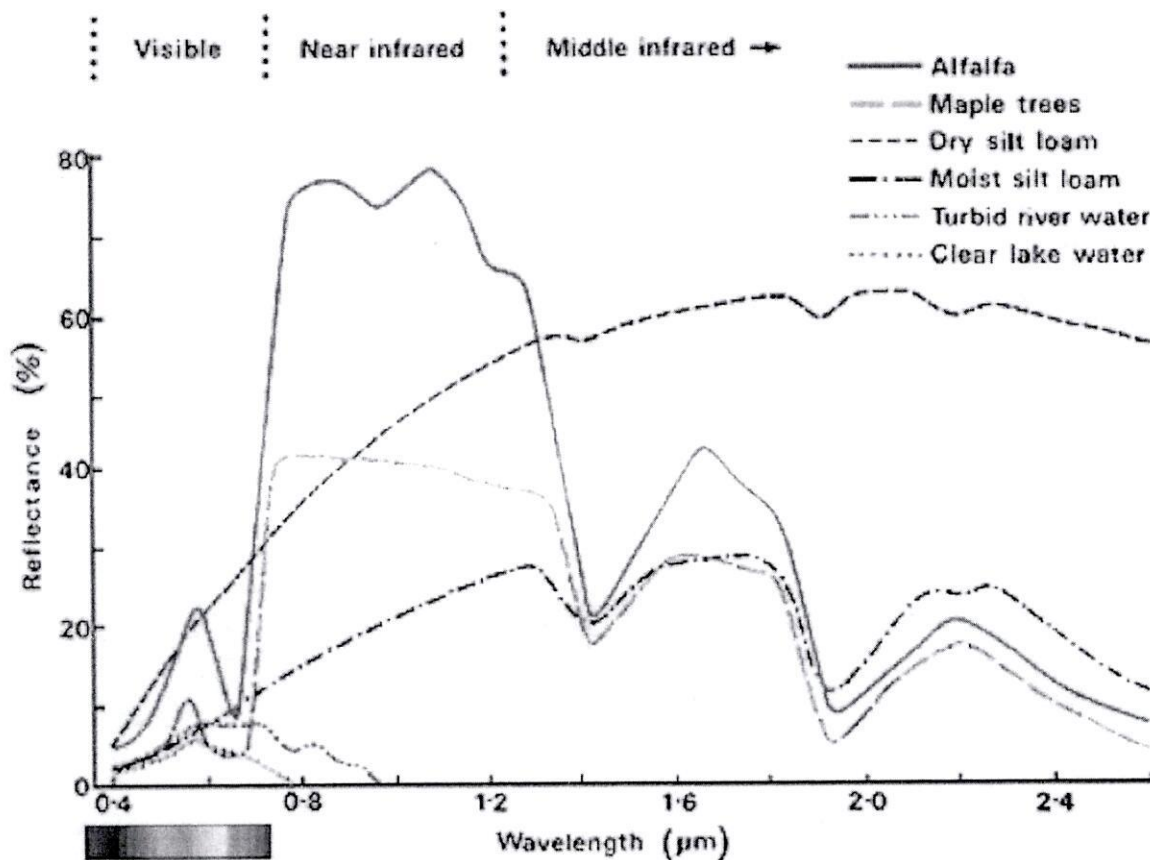
Figure 1: Relationship between spectral reflectance and wavelengths

4. a. Explain any five elements of visual image interpretation. [10]

b.
i. Distinguish between a geographic field and a geographic object [2]

ii. Represent the following geographic phenomena as either geographic field or geographic objects:

A mountain; Elevation or slope; temperature; Buildings; Rivers; Clay content of the soil; Soil moisture; Rainfall [8]

c. Distinguish between raster data model and vector data model. [5]

5. With reference to real world examples, outline the application areas of Remote sensing and GIS. [25]

END OF PAPER