BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCES

DEPARTMENT OF ENVIRONMENTAL SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE IN SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT

ES209 (3): GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING

DURATION: 2 HRS TOTAL MARKS: 70

INSTRUCTIONS TO CANDIDATES

Answer question 1 and any other two.

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1. (a) Define the following terms:
   (i) Remote sensing, [2 Marks]
   (ii) Geo-referencing, [2 Marks]
   (iii) Buffer zone, [3 Marks]
   (iv) Spectral signature. [3 Marks]

   (b) Distinguish between the following:
   (i) Geographic Coordinate system and projected coordinate system, [4 Marks]
   (ii) Multi-spectral remote sensing and hyper-spectral remote sensing, [4 Marks]
   (iii) Supervised image classification and unsupervised image Classification. [4 Marks]

   (c) Explain the four major types of resolution important in determining the quality of GIS and remote sensing data. [8 Marks]

2. (a) Discuss the applications of any two vegetation indices. [8 Marks]

   (b) Describe the characteristics of Sentinel-2 imagery. [12 Marks]

3. (a) Explain the application of the global positioning system in your field of study. [10 Marks]

   (b) Discuss the sources of spatial data in GIS projects. [10 Marks]

4. (a) Describe the nature of electromagnetic radiation. **[6 Marks]**

   (b) Discuss the sources of error in Geographic Information Systems (GIS) and remote sensing projects. **[14 Marks]**

5. (a) Explain the interaction of electromagnetic radiation with components of the atmosphere. **[12 Marks]**

   (b) Explain any two methods of image classification. **[8 Marks]**

END OF PAPER