# MAASAI MARA UNIVERSITY

## REGULAR UNIVERSITY EXAMINATIONS
## 2023/2024 ACADEMIC YEAR
## FIRST YEAR FIRST SEMESTER

## SCHOOL OF NATURAL RESOURCES, ENVIRONMENTAL STUDIES AND AGRICULTURE

## BACHELOR OF ARTS IN EDUCATION
## BACHELOR OFENVIRONMENTAL PLANNING AND MANAGEMENT
## BACHELOR OF WILDLIFE MANAGEMENT

## COURSE CODE: GEO 1106-1
## COURSE TITLE: INTRODUCTION TO REMOTE SENSING AND GIS

**DATE: 6/2/2024** **TIME: 1430-1630 HRS**

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**INSTRUCTIONS TO CANDIDATES**

Answer **ALL** questions in section **A,** any other **TWO** in section **B** and **ONE** in section **C.** Use relevant examples and illustrations.

***This paper consists of 3 printed pages. Please turn over***

**SECTION A - 20 MARKS (Answer ALL the questions)**

Q1. a) Define the following terms:

(i) Atmospheric Window **(1 mark)**

(ii) Electro-magnetic spectrum **(1 mark)**

b) Compare and Contrast;

(i) How radiometric and temporal resolution impact the quality of data collected by remote sensing instruments? **(2 marks)**

(ii) Explain the fundamental differences between passive and active remote sensing **(2 marks)**

Q2. Describe the key properties of electromagnetic energy that render it valuable for applications in remote sensing. **(2 marks)**

Q3. Giving examples, explain two main sources of spatial data. **(2 marks)**

Q4. Discuss **three (3)** types of remote sensing techniques categorized by the platform used and provide a brief explanation of each type, highlighting their applications and the advantages they offer. **(6 marks)**

Q5. Distinguish between spatial and non-spatial data, and provide examples that illustrate the differences between these two types of data. **(2 marks)**

Q6. Explain the differences between raster and vector data structures in Geographic Information Systems and briefly outline their respective advantages. **(2 marks)**

**SECTION B - 20 MARKS (Choose and answer any TWO questions)**

Q7. Discuss the components of a Geographic Information System (GIS) and how they function to provide a unified system. **(10 marks)**

Q8. (a) With illustrative details, explain how the remote sensing technology work and the key steps involved in the process. **(7 marks)**

b) Explain ONE advantages and TWO limitations of using remote sensing over other conventional methods of data acquisition. **(3 marks)**

Q9. By use of Illustrations and explain the differences in spectral reflectance curves between healthy vegetation, dry barren soil, and clear water bodies, describing the underlying physical processes that contribute to the differences. (**10 marks)**

**SECTION C- 10 MARKS (Choose any ONE questions)**

**(THIS SECTION WILL BE ATTEMPTED BY ENVIRONMENTAL PLANNING AND MANAGEMENT (EPM) AND WILDLIFE MANAGEMENT STUDENTS ONLY)**

Q10. (a) Explain how remote sensing techniques would be employed to assess and monitor tree health and growth in forest management (**5 marks)**

(b) Provide specific examples of remote sensing tools and data sources, and explain how these technologies contribute to sustainable forestry practices. (**5 marks)**

Q11. Discuss how remote sensing can aid in the assessment and monitoring of water resources in agricultural landscapes. (**10 marks)**

**(THIS SECTION IS TO BE ATTEMPTED BY EDUCATION STUDENTS ONLY)**

Q10. You have been given a project to assess suitable locations for the construction of new schools in an urban area using GIS technology. Outline the main steps and analyses you would perform to identify optimal sites and provide specific examples of how GIS can inform decision-making in educational infrastructure planning. (**10 marks)**

Q11. Discuss the potential applications of Geographic Information Systems (GIS) in the education field and explain how GIS can be utilized to enhance various aspects of educational institutions.

**(10 marks)**

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