



University of Ruhuna- Faculty of Technology
Bachelor of Biosystems Technology Honours Degree
Level II (Semester II) Examination, November/December 2025
Academic year 2023/2024

Course Unit: BST 2222 Geoinformatics and Biosystems (Written)
Duration: 1.5 hours

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INSTRUCTIONS

- Answer **ONLY THREE (03)** questions.
- Use a separate book for answering the questions.
- Each question should start with a new page.

Question One

Remote sensing has become an indispensable tool for monitoring and managing Earth's resources across multiple sectors including agriculture, forestry, fisheries, disaster management, and environmental conservation.

- A. Differentiate between active and passive remote sensing systems and explain the remote sensing process involved in their operation. (10 Marks)
- B. Select a biosystems-related sector (e.g., agriculture, fisheries, forestry) and describe how remote sensing can be used to address specific challenges within that sector. (15 Marks)

Question Two

Geographic Information Systems (GIS) have revolutionized spatial data management and decision-making across multiple sectors. Demonstrate your comprehensive understanding of GIS principles and applications by answering the following questions.

- A. List the fundamental components of GIS. (3 Marks)
- B. How does GIS differ from traditional mapping systems? (7 Marks)
- C. Describe how GIS technology is used in managing and responding to events such as disasters and pandemics. (15 Marks)

Question Three

- A. Briefly explain how the spectral reflectance of vegetation varies across different regions of the electromagnetic spectrum. (5 Marks)
- B. The following scenario is based on NDVI evaluations of a rice paddy field monitored over a growing season using satellite imagery:

Growth Stage	NDVI Value
Just after planting (Week 1)	0.15
Vegetative stage (Week 6)	0.72
Peak growth (Week 10)	0.85
Pre-harvest (Week 14)	0.58
After harvest (Week 16)	0.12

- I. Explain why NDVI values change across different growth stages (5 Marks)
- II. What do the peak NDVI values indicate about crop health and chlorophyll content? (5 Marks)
- III. Why does NDVI decrease during the pre-harvest and after harvest stages? (5 Marks)
- IV. How can this temporal NDVI pattern be used for drought prediction and water management? (5 Marks)

Question Four

Discuss the importance of maps as tools for biosystems technologists. Within your answer, explain the key characteristics that make maps effective for visualizing spatial data and supporting decision-making in sectors such as agriculture, forestry, fisheries, and environmental management. (25 Marks)

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