

NATIONAL UNIVERSITY OF LESOTHO
DEPARTMENT OF GEOGRAPHY & ENVIRONMENTAL SCIENCES
B.Sc. SUPPLEMENTARY EXAMINATIONS
ES 3412: Introduction to Remote Sensing

August 2023

Marks: 100

Time: 3 hours

Instruction: Answer any four questions. Where appropriate illustrate your answers with sketches/diagrams.

QUESTION 1

Discuss the advantages and disadvantages of using satellite observations for monitoring the earth surface processes (25)

QUESTION 2

Discuss the electromagnetic spectrum with special reference to:

- a) Energy involved (8)
 - b) Sources of energy (4)
 - c) Atmospheric windows (13)
- {25}

QUESTION 3

a) Write short notes on the following

- i) Spatial resolution (3)
- ii) Temporal resolution (3)
- iii) Bands (3)
- iv) Panchromatic sensor (3)
- v) Multispectral sensor (3)
- vi) Hyperspectral sensor (3)

b) What are the implications for remote sensing of this statement “ the longer the wave length the lower the energy”? (7)

{25}

QUESTION 4

Discuss the spectral reflectance curves for vegetation, soil and water resources and discuss bands of the electromagnetic spectrum that are commonly used when studying the above three (25)

QUESTION 5

- a) With the aid of a diagram, discuss the concept spectral reflectance (10)
 - b) What are vegetation indices? (5)
 - c) Why do we have so many vegetation indices? (10)
- {25}

QUESTION 6

Discuss the processes that may occur on electromagnetic waves as they hit the earth surface (25)