



UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER

PROGRAMME; BSc. AGRICULTURAL AND BIOSYSTEMS ENGINEERING III

COURSE CODE: ABE 307

TITLE OF PAPER: REMOTE SENSING AND GIS

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER
QUESTIONS

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CHIEF INVIGILATOR

QUESTION ONE: COMPULSORY QUESTION

- a) Using an example, illustrate how remotely sensed data can be used to determine organic content of a soil. (10 marks)
- b) Discuss how spectral reflectance of an object can be calculated. (10 marks)
- c) Describe the following terms as applied in remote sensing, using examples to illustrate your answers:
 - i) Spatial resolution (10 marks)
 - ii) Temporal resolution (10 marks)

QUESTION TWO

- a) Using results from a hypothetical image classification, illustrate how the overall accuracy can be determined. (15 marks)
- b) Discuss how data could be integrated from raster GIS to vector GIS, indicating the different formats at which such data could come. (15 marks)

QUESTION THREE

- a) Describe how the Normalised Difference Vegetation Index (NDVI) is calculated, and how it can be used to differentiate landscape features. (15 marks).
- b) Describe how wavelength of maximum spectral radiant exitance can be determined for an object of known temperature. (15 marks)

QUESTION FOUR

- a) Describe the three stages of supervised image classification, highlighting the activities under each stage. (15 marks)
- b) Discuss three ways in which a GPS can be used in management of land resources. (15 marks)