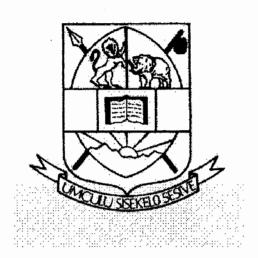
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UNIVERSITY OF SWAZILAND FINAL EXAMINATION PAPER

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 \cdot

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QUESTION 1: COMPULSORY QUESTION

a) Using illustrations, discuss how binary masking can be used show the presence and absence of water bodies from digital satellite data. (10 marks)

- b) Discuss three sources of data that can be used in GIS, specifying how the data can be used in land and water management. (18 marks)
- c) Calculate the total radiant exitance from the surface of a material that has a temperature of 26°C. (Stefan-Boltzmann constant is 5.6697 x10⁻⁸ W m⁻² K⁻⁴)
 (12 marks)

QUESTION 2.

- a) Define spectral reflectance and use an example to illustrate how spectral reflectance of water would compare with that of green vegetation in the Red band. (15 marks)
- b) Discuss the following terms in relation to remote sensing:

i. Overall accuracy

(5 marks)

ii. Producer's accuracy

(5 marks)

iii. User's accuracy

(5 marks)

QUESTION 3.

- a) Using an example, discuss how water content will affect the reflectance of a soil. (12 marks)
- b) Discuss how the Normalised Difference Vegetation Index (NDVI) can be used to assess the biomass of dense vegetation cover. (18 marks)

QUESTION 4.

a) Discuss how the following can be used to present attribute data in vector GIS:

i. Ranks

(5 marks)

ii. Categories

(5 marks)

iii. Proportions

(5 marks)

b) Discuss three applications of a GPS in remote sensing and or GIS. (15 marks)