

UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING

FINAL EXAMINATION, MAY 2015

B.A, BSc, BASS, B.Ed.

TITLE OF PAPER: INTRODUCTION TO REMOTE SENSING

COURSE NUMBER: GEP 313

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS:

- 1. ANSWER THREE QUESTIONS**
- 2. QUESTION 1 IS COMPULSORY**
- 3. ILLUSTRATE YOUR ANSWERS WITH
EXAMPLES AND CLEARLY DRAWN DIAGRAMS
WHERE APPROPRIATE**

**ALLOCATION OF MARKS: QUESTION 1 (COMPULSORY) CARRIES
40 MARKS WHILE THE REST CARRY
30 MARKS EACH**

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS
GRANTED BY THE INVIGILATOR**

GEP 313: INTRODUCTION TO REMOTE SENSING-MAY 2015

SECTION A: COMPULSORY

Question 1

- a) Describe the effects of the atmosphere on the electromagnetic energy. (15 marks)
- b) Explain how atmospheric windows influence the design of the optical satellite sensors spectral bands. (15 marks)
- c) Compare and contrast active and passive remote sensing. (10 marks)

(40 marks)

SECTION B: ANSWER ANY TWO QUESTIONS

Question 2

The use of pictorial elements is important in visual interpretation of vertical aerial photographs. Explain how these pictorial elements are used in distinguishing landscape features for land cover mapping purposes.

(30 marks)

Question 3

Using a diagrammatical illustration for green vegetation, water and dry bare soil, describe the factors that influence their different spectral reflectance curves.

(30 marks)

Question 4

Define the following terms;

- i) Normalised Difference Vegetation Index (NDVI) (5 marks)
- ii) Binary masking (5 marks)
- iii) Red Edge (5 marks)
- iv) Radiometric resolution (5 marks)

- v) Unsupervised image classification (5 marks)
 - vi) Ground-truthing (5 marks)
- [30 marks]**

Question 5

- a) Describe either SPOT or Landsat TM 5 satellite mission in terms of the following;
 - i) Its orbit (2 marks)
 - ii) Swath width (2 marks)
 - iii) Spectral resolution (12 marks)
 - iv) Radiometric resolution (3 marks)
 - v) Spatial resolution (3 marks)
 - vi) Temporal resolution (3 marks)
 - b) Briefly describe any two image enhancement techniques. (5 marks)
- (30 marks)**