UNIVERSITY OF SWAZILAND

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND

PLANNING

FINAL EXAMINATION, MAY 2017

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. IILUSTRATE 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 2017

SECTION A: COMPULSORY

QUESTION 1

With specific examples and illustrations, discuss factors you would consider in spatial planning and implementation of a development project for monitoring and management of natural forest resources through the use of remote sensing techniques for Swaziland.

(40 Marks)

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 2

a) Using an illustrative diagram for green vegetation, describe the factors that influence its spectral reflectance curve in the blue, NIR and SWIR portions of the spectrum. (15 marks)
b) Using examples, explain how the Normalised Difference Vegetation Index (NDVI) is used to distinguish various Earth's surface features. (15 marks)

(30 Marks)

QUESTION 3

Using examples and illustrations where appropriate, discuss the four types of image resolution, highlighting how each is considered in environmental remote sensing.

(30 Marks)

QUESTION 4

a) 'Unlike RADAR and LiDAR data, optical data can only 'see' the top of the environment.' Using illustrations, explain this and discuss the advantages and disadvantages of this in using optical remote sensing for land cover mapping. (20 marks)
b) Explain how the limitations of optical data can be overcome by RADAR data, either in singularity, or when integrated with the optical data. (10 marks)

(30 Marks)

QUESTION 5

'The use of pictorial elements is important in distinguishing various features on aerial photographs.' Explain how pictorial elements are used in aerial photo-interpretation for land cover mapping purposes. **(30 Marks)**