

**UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING**

SUPPLEMENTARY EXAMINATION: JULY 2006

TITLE OF PAPER : INTRODUCTION TO REMOTE SENSING

COURSE NUMBER : GEP 313

TIME ALLOWED : THREE (3) HOURS

**INSTRUCTIONS : SECTION A IS COMPULSORY
ANSWER ANY TWO QUESTION S FROM
SECTION B
ILLUSTRATE YOUR ANSWERS WITH
APPROPRIATE DIAGRAMS**

**MARKS ALLOCATED : QUESTION 1 CARRIES 40 MARKS
THE OTHER QUESTIONS CARRY 30
MARKS EACH**

**THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED
BY THE INVIGILATOR**

SECTION A: COMPULSORY QUESTION

QUESTION 1

- a) Select **ONE** (1) of the satellite systems below and discuss the system under the following headings - bands / sensors offered (including resolution, sensor type, special characteristics, swath etc), special features, and common applications. (30 marks)

QUICKBIRD 2 LANDSAT TM NOAA / AVHRR

- b) Compare and contrast passive and active sensors using appropriate examples. (10 marks)
(40 marks)

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 2

- a) Name three properties of clouds that would aid development of a 'cloud mask' for remotely sensed data. (6 marks)
- b) Outline the process of aerial photo interpretation using a pair of stereoscopes and the issues that one has to know before the process of stereo interpretation. (15 marks)
- c) With the aid of suitable diagrams briefly discuss the following:
- i. satellite orbit (5 marks)
 - ii. swath (4 marks)
- (30 marks)

QUESTION 3

- a) Discuss Raleigh and non-selective scatter. (15 marks)
- b) In general terms, explain how the atmosphere might affect the signal received by a sensor located above the atmosphere (e.g., on a satellite). (15 marks)
- (30 marks)

QUESTION 4

a) What are the two main types of satellites, as defined by their orbits? Which of these satellites orbits at an altitude that is closer to the Earth? (15 marks)

b) Using a properly labelled and appropriate drawing, discuss the properties of a wave. (15 marks)

(30 marks)

QUESTION 5

a) Define the following:

i. Transmittance (2 marks)

ii. Absorptance (2 marks)

iii. Irradiance (2 marks)

b) Draw the typical reflectance vs. wavelength plot for a green leaf, label the two chlorophyll absorption bands and the two water absorption bands. (9 marks)

c) Briefly describe the various forms of resolution used in describing remote sensors. (15 marks)

(30 marks)