

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

SUPPLEMENTARY EXAMINATION, JULY 2011

B.A., BASS, BSc, 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. REMEMBER TO USE APPROPRIATE
TERMINOLOGY AND ILLUSTRATIONS**

**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– JULY 2011

SECTION A: COMPULSORY QUESTION

QUESTION 1

- a) Use a diagrammatical illustration of the pathways of electromagnetic radiation from the sun to a satellite sensor and explain these pathways and processes. (30 marks)
- b) Compare and contrast kinetic temperature and radiant temperature. (10 marks)
- (40 marks)**

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 2

- a) Define remote sensing. (5 marks)
- b) Discuss two supervised classification techniques/algorithms. (10 marks)
- a) Explain the two models of light. (10 marks)
- (30 marks)**

QUESTION 3

- a) Briefly explain atmospheric windows and the processes that are responsible for not allowing electromagnetic radiation to pass through the atmosphere as well as what ranges of the electromagnetic spectrum are principally affected by these processes. (20 marks)
- b) Discuss the colour addition and colour subtraction theories. (10 marks)
- (30 marks)**

QUESTION 4

- a) Describe one of the several radiometric correction techniques used to minimize clouds/haze in an image. (10 marks)
- b) Discuss both geostationary and sun-synchronous orbits. (12 marks)
- c) Define emissivity. (3 marks)

- d) What common material on the earth's surface has emissivity close to 1.0? (2 marks)
 - e) Define the red edge. (3marks)
- (30 marks)**

QUESTION 5

- a) Describe one modern very high resolution multispectral satellite (sensor) in terms of:
 - a. its orbit, (2 marks)
 - b. its swath, (3 marks)
 - c. its temporal resolution and; (3 marks)
 - d. its spectral resolution. (12 marks)
 - b) Briefly define the following:
 - a. Radiometric correction (5 marks)
 - b. Geometric correction (5 marks)
- (30 marks)**