"Investing in Africa's Future"

COLLEGE OF SOCIAL SCIENCES, THEOLOGY, HUMANITIES AND EDUCATION

HGE309: REMOTE SENSING AND AIR PHOTO INTERPRETATION

END OF SECOND SEMESTER EXAMINATIONS

NOVEMBER/DECEMBER 2017

LECTURER: Mr. D. Munasirei

DURATION: THREE (3) HOURS

GENERAL INSTRUCTIONS TO CANDIDATES

1. **Do NOT write your name on the answer sheet**
2. Use answer sheets provided
3. This paper contains **TWO sections** – **SECTION A** and **SECTION B**
4. Answer **FOUR sub-questions** of Question 1 in **SECTION A**
5. Answer any **TWO (2)** questions from **SECTION B**
6. **Take note of mark distribution in each question.**
7. Read and understand all questions before you answer
8. Where necessary, illustrate your answers with sketches, figures and diagrams

SECTION A: Answer any FOUR sub-questions in Question 1.

(Each question in Section A carries 10 marks.)

Question One

i) Of the five senses discuss how any **TWO** may be considered forms of remote sensing. **(10)**

ii) Distinguish between **satellite** and **spacecraft**. **(10)**

iii) Discuss the importance of satellite technology in remote sensing. **(10)**

iv) With examples, distinguish between a **photograph** and an **image**. **(10)**

v) With illustrations discuss the importance of any TWO types of scattering **remote sensing. (10)**

vi) Discuss the characteristics of four satellite resolution systems. **(10)**

vii) Explain why most remote sensing systems avoid detecting and recording wavelengths in the **ultraviolet** and **blue portions** of the spectrum. **(10)**

viii) Using the '**grey scale**' show how a photograph can be displayed in digital format. **(10)**

ix) Briefly discuss any **TWO** of the following:

a) Terrestrial photograph **(5)**

b) Aerial photograph **(5)**

c) Satellite photograph. **(5)**

x) Show your understanding of stereoscopic perception (stereovision). **(10)**

(Total for Question 1 = 40 Marks)

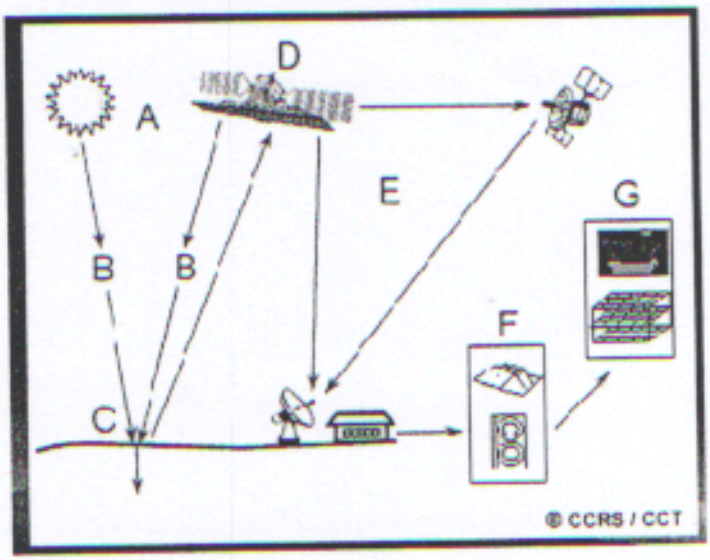
SECTION B (Answer any TWO Questions. Each question carries 30 marks)

Question Two

"The world is full of magical things waiting for our wits to grow sharper" Eden Phillpotts (1862-1960). Discuss this statement in relation to the 'new eyes' that have emerged in Remote Sensing since the late 1930s. **(30)**

Question Three

Figure 1: Components of the Remote Sensing System



a) Study Figure 1 showing the components of the Remote Sensing System and identify components A, B, C, D, and E.

b) Discuss the major processes involved in electromagnetic radiation including the radiation laws that govern the behaviour of radiation in the Earth-Atmosphere system. **(30)**

Question Four

Discuss the following features for any **ONE** photographic system you have studied:

(i) Wavelengths **(5)**
(ii) Resolution **(5)**
(iii)Special Facilities **(10)**
(iv)Applicability **(10)**

Question Five

Oblique and vertical aerial photographs differ significantly in their geometric relationship to the terrain and cultural (human) landscape. Discuss this statement with reference to the relative advantages and limitations of the two types of photographs. **(30)**

Question Six

(a) Discuss the importance of any **TWO** of the following elements in studying vertical aerial photographs:

i) First order elements **(5)**
ii) Second order elements **(5)**
iii) Third order elements **(5)**

(b) With examples, discuss the importance of any **FOUR** of the following basic characteristics in interpretative photogrammetry:

i. Tone and hue **(5)**
ii. Texture **(5)**
iii. Shape and size **(5)**
iv. Shadows **(5)**
v. Pattern **(5)**
vi. Relative location **(5)**

- END OF QUESTION PAPER -