



WI-244-14

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATIONS 2017/2018**  
**EXAMINATION FOR THE DEGREE OF BACHELOR**

**ALP 2307: REMOTE SENSING II**

**DATE: JANUARY 2018**

**TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND  
ANY OTHER TWO QUESTIONS**

**QUESTION ONE**

- a. Define the following terms as used in remote sensing:- (5 marks)
- i. Electromagnetic spectrum
  - ii. IFOV
  - iii. Nadir
  - iv. 'Whiskbroom' scanning
  - v. Polar orbit
- b. Differentiate between multispectral and hyperspectral remote sensing. (2 marks)
- c. Mention any 2 sun-synchronous and 2 geostationary satellites used in earth resources surveys. (4 marks)
- d. Briefly explain 4 types of resolution. (4 marks)
- e. Give a brief account of the following satellite missions. Mention their limitations. (15 marks)
- i. LandSat
  - ii. NOAA AVHRR
  - iii. Radar

## **QUESTION TWO**

- a. Explain the process and elements involved in electromagnetic remote sensing of earth resources. (10 marks)
- b. You are asked to provide an outline proposal for a new satellite remote sensing system platform to quantify the loss of vegetation in Mau complex water tower to agricultural land use. It is key that the system be able to observe a given region more than once during a year in order to monitor intra-annual changes. Your proposal should carefully consider the mission requirements and describe the resulting trade-offs that may be required in sensor type (s), wavelengths, spatial resolution and orbit. (10 marks)

## **QUESTION THREE**

- a. What is digital image processing? (2 marks)
- b. Briefly explain the main elements of visual image interpretation. (5 marks)
- c. Briefly outline the pre-processing stages of geometric correction and radiometric calibration that typically applied to remotely sensed data in converting from raw DN to at-sensor radiance. (8 marks)
- d. Differentiate between supervised and unsupervised classification. (2 marks)
- e. Define the following terms:- (3 marks)
  - i. Change detection analysis
  - ii. Principal Component Analysis (PCA)
  - iii. NDVI

## **QUESTION FOUR**

Discuss in details any application of remote sensing in land resources planning and management. Mention the type of remote sensing including satellite/sensors suitable for the study. (20 marks)