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**TECHNICAL UNIVERSITY OF MOMBASA**  
**FACULTY OF APPLIED AND HEALTH SCIENCES**  
**DEPARTMENT OF ENVIROMENT & HEALTH SCIENCES**  
**UNIVERSITY EXAMINATION FOR:**  
**DIPLOMA IN ENVIRONMENTAL SCIENCE**  
**DES/16S/YEAR 2/ SEMESTER 1**

**AES 2205: INTRODUCTION TO GIS AND REMOTE SENSING**  
**SPECIAL/ SUPPLIMENTARY EXAMINATIONS**  
**SERIES: SEPTEMBER 2018**  
**TIME: 2 HOURS**

***Instructions to Candidates***

This paper consists of FIVE questions

Answer question ONE (COMPULSORY) and any other TWO questions.

***This paper consists of one printed pages.***

***Mobile phones are NOT allowed in the examination room***

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**QUESTION ONE**

- a) Differentiate between the following;
- i. Passive and active sensors
  - ii. Radiance and irradiance in remote sensing (4 marks)
- b) Give the functions of the following parts of an aerial camera;
- i. Reels
  - ii. Vacuum platen
  - iii. Shutter
  - iv. Filter (4 marks)
- c) Explain any three sensor characteristics of Landsat 8 satellite systems (6 marks)
- d) Define the following terms as applied in GIS and Remote Sensing;
- i. Spectral bands
  - ii. Atmospheric transmission window
  - iii. Sensor

- iv. Atmospheric scattering
- v. Electromagnetic spectrum
- vi. Spatial systems (6 marks)

### **QUESTION TWO**

- a) Map projections involve transformation of coordinates from curved surfaces to plane surfaces. Generally, explain any three limitations of map projection systems.(3 marks)
- b) Explain why spectral reflectance techniques for analyzing vegetation may not be ideal during autumn seasons. (2 marks)
- c) A tree species in Mau forest is feared to be facing extinction. This triggers the need to save this species. You are a GIS and Remote Sensing expert contacted to help give answers to questions e.g on the rate of deterioration, the extent of coverage in a given time and the current distribution of the species in the forest. Briefly outline how this can be achieved by spectral reflectance techniques for vegetation. (10 marks)

### **QUESTION THREE**

- a) Explain the five components of a Geographic Information System (10 Marks)
- b) Differentiate between specular and diffuse reflection (5 Marks)

### **QUESTION FOUR**

- a) With aid of diagrams, explain different ways of determining the scale of aerial photographs (8 marks)
- b) Outline the process of flight planning (7 marks)

### **QUESTION FIVE**

- a) With aid of a well labelled diagram, show parts of an aerial camera including its main segments (10 marks)
- b) Explain any five principles of photo/image interpretation (5 marks)