



**MASEÑO UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2013/2014**

SECOND YEAR FIRST SEMESTER EXAMINATIONS FOR THE  
DEGREE OF BACHELOR OF SCIENCE IN EARTH SCIENCE WITH  
INFORMATION TECHNOLOGY

(MAIN CAMPUS)

**NGA 205: REMOTE SENSING**

*Date: 26<sup>th</sup> November, 2013*

*Time: 11.00 a.m. - 1.00 p.m.*

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**INSTRUCTIONS:**

- Answer Question ONE and any other TWO questions.
- Sketch maps and diagrams should be used whenever appropriate.

## NGA 205: REMOTE SENSING

1. (a) Give a comprehensive definition of remote sensing. 3 marks
- (b) Describe the following terms
- (i) Temporal resolution 2 marks
  - (ii) Spatial resolution 2 marks
  - (iii) Local Sun time 2 marks
  - (iv) Swath 2 marks
- (c) Explain how the planning of an aerial photography mission is carried out. 9 marks
- (d) Examine the advantages of using remote sensing in natural resources management. 10 marks
2. (a) An aerial photography survey is to be carried out to determine compensation for land hived away from individuals for a power transmission line project. The terrain of the area to be surveyed is fairly flat and measures 230km x 10km. If the required scale of the photographs is 1:25,000 and a metric aerial camera with a focal length of 152mm is to be used. Determine
- (i) The flight height 4 marks
  - (ii) The number of photographs required. 9 marks
- (b) Examine applications of RADAR imagery in environmental sciences. 7 marks
3. (a) Examine a remote sensing system used to map sea surface temperature. 10 marks

(b) Discuss scanner systems that are employed in remote sensing.

10 marks

4. (a) Explain the advantages of the Synthetic Aperture Radar (SAR) over the Real Aperture Radar (RAR) systems.

8 marks

(b) Examine causes of geometric distortions in imagery data.

12 marks

5. (a) Discuss how remote sensing is utilized in oil and ground water exploration.

12 marks

(b) Examine orbits used by remote sensing satellites.

8 marks

6. (a) Explain how the following interact with electromagnetic radiation and their implication to data capture

(i) Nitrogen and Oxygen 4 marks

(ii) Ozone 4 marks

(iii) Water vapour 4 marks

(b) Examine the nature of electromagnetic radiation.

8 marks