

University of Pretoria  
Department of Geography, Geoinformatics and  
Meteorology  
GMA 320: Remote Sensing Sick test

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**Total: 50 Marks**

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## Instructions

Duration T [minutes]: 60

*Answer all questions as concisely as possible.*

## Question 1 [13 marks]

1. Define the following terms commonly used in remote sensing[**6 marks**]
  - Atmospheric window [ 2 marks]
  - Hyperspectral remote sensing [2 marks]
  - A pixel [2 marks]
2. Name three possible causes of low Signal to Noise ratio (S/N) in *in situ* measurements? [**3 marks**]
3. State four merits of remote sensing. [**4 marks**]

## Question 2 [8 marks]

1. One important characteristic to describe a satellite sensor is its data collection capabilities. Name two spectral and two non-spectral characteristics of a sensor [4 marks]
2.  $12 \text{ [Wm}^{-2}\text{]}$  of light falls on a surface which transmits 33 % and absorbs 25% of the light. What is the amount of light reflected by this surface in  $\text{Wm}^{-2}$ ? What assumption is made while solving this problem? [4 marks]

## Question 3 [12 marks]

1. Using an example, state the difference between systematic and random distortions in a remote sensing imagery. [6 marks]
2. Describe briefly the two methods of geometric correction that can be done on a remote sensing image [6 marks]

## Question 4 [16 marks]

1. Name two ways through which digital imagery can be obtained [2 mark]:
2. What is the importance of the preprocessing stage in the data-to-information conversion process in remote sensing? [3 mark]
3. Multispectral sensors typically acquire images by sensing reflected radiation in the visible, near and mid infrared wavelengths. Can we use these images to directly map things like vegetation species or crop types? If not, what sort of a process can we use to derive a map of vegetation species or crop type? [6 mark]
4. How might the spatial and spectral resolution of images acquired by different multispectral remote sensing systems influence the potential precision and accuracy of a landcover map derived from these images? [5 marks]