University of Pretoria
Department of Geography, Geoinformatics and Meteorology
GMA 320: Remote Sensing
Special/ancillary exam

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December 6, 2010

Instructions

Duration T [minutes]: $60 \leq T \leq 70$
Answer all questions as concisely as possible.

Question 1

1. What is the role of *in situ* measurements in remote sensing? [**3 marks**]

2. Outline important stages of a remote sensing process. [**7 marks**]

3. Name any two merits of digital image processing in remote sensing. [**4 marks**]

Question 2

Digital remotely sensed data are transformed to useful information, possibly via the conversion of an analog electrical signal data recorded by the remote sensing sensor to a digital value.

1. What is the importance of the preprocessing stage in the data-to-information conversion process in remote sensing? [**4 marks**]

2. By giving examples, distinguish between multi-spectral and utra-spectral remote sensing systems.[**4 marks**]

3. Name two reasons why *pushbroom* sensor technology plays an important role in remote sensing [**2 marks**]

Question 3

1. Name any three factors that influence the choice of a digital image processing system. [**3 marks**]

2. Name any three main features that an ideal remote sensing storage media should have. [**3 marks**]

3. Comment on the role of a remote sensing digital image analyst in digital image analysis process. [**3 marks**]

Question 4

1. Differentiate between supervised and unsupervised classification [**3 marks**]

2. Name at least three classification training tools [**3 marks**]

3. Write short notes on the following non-parametric algorithms used in remote sensing image classification. Be sure to include their merits and demerits:

   - Paralleppiped [**3 marks**]
   - the maximum likelihood [**3 marks**]
   - Minimum-distance to means [**3 marks**]

4. What is spectral ratioing? [**3 marks**]

5. What is the drawback of the normalized difference ratioing? [**3 marks**]

6. What is contrast stretching? [**3 marks**]

7. What is the role of Principal Component Analysis (PCA) in remote sensed image analysis? [**3 marks**]