

**UNIVERSITY OF KWAZULU-NATAL
WESTVILLE/HOWARD COLLEGE CAMPUS
MAIN EXAMINATION: JUNE 2013**

**SCHOOL: AGRICULTURAL, EARTH AND ENVIRONMENTAL SCIENCES
LEVEL: III
MODULE: GIS AND REMOTE SENSING
CODE: ENVS316**

DURATION: 3 HOURS

TOTAL MARKS: 300

**INTERNAL EXAMINERS: DR M. GEBRESLASIE AND DR N. NGETAR
EXTERNAL EXAMINER: PROF S GRAB**

INSTRUCTIONS:

This paper consists of TWO SECTIONS in TWO pages

**Answer THREE questions. Choose at least ONE question from EACH SECTION,
and a THIRD one from either SECTION**

SECTION A

All questions are worth 100 marks

1. Describe and discuss some of the most important spatial analysis functions that a standard GIS provides.
2. Differentiate between data quality, accuracy and precision in GIS. Outline the methods used in assessing error in spatial data.
3. Describe a typical application of GIS in an area of your choice. In your description, include a statement of the problem, how the data would be collected and analyzed, and how the results are best presented.

SECTION B

All questions are worth 100 marks

4. Image rectification, restoration and resampling are methods of geometric image correction. Provide a detailed discussion of these methods, including the advantages and disadvantage of each resampling method.

5. In the electromagnetic spectrum, atmospheric windows play a great role in remote sensing. Give an overview of the electromagnetic spectrum in which you describe and discuss the various wavelengths used in remote sensing and their capabilities.
6. Compare the different ways in which incident radiation will interact with features on the earth's surface and explain the spectral reflectance characteristics of water, green vegetation and soil.