

**UNIVERSITY OF KWAZULU-NATAL  
SCHOOL OF AGRICULTURAL, EARTH & ENVIRONMENTAL SCIENCES  
DISCIPLINE OF GEOGRAPHY  
PRACTICAL TEST 25 MAY 2012  
MODULE NAME & CODE: ANALYTICAL GIS AND ADVANCED SPATIAL  
MODELLING, ENVS712**

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**DURATION: 3 HOURS**

**TOTAL MARKS: 15**

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**INTERNAL EXAMINER: DR M GEBRESLASIE**

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**INSTRUCTIONS: THIS PAPER CONSISTS OF TWO PAGES.**

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**Section A**

You are provided with data on the Drakensberg fire under *V:\ENVS712\Prac\_Exam\Section A*.

1. What is the total area in hectares burnt by Accident, Arson, Invasive, and Lightning type fires? [1 Mark]
2. The fire data has 14 compartments, and each compartment has a sub-division called blocks (as you can see from the attribute table). How many polygons or blocks are named under Cobham? [1 Mark]
3. How many times have accidental fires occurred in the Cobham compartment? [1 Mark]
4. How many compartments have an area of greater than 100 ha? What is the total area of these compartments? [3 Marks]

## **Section B**

The government, through the planning department, has commissioned a project to extend a new freeway in an area. As a GIS consultant tasked with reviewing the plans, you are provided with the following data sets:

- The study area boundary
- Roads, (a line Shapefile of roads)
- Old freeway, (a line Shapefile of the old freeway alignment)
- Land cover, (a polygon Shapefile of land cover types in the study area)
- Oribi, (a polygon Shapefile indicating contiguous oribi habitat patches)
- Contour, (a Shapefile of contours 10 meter intervals, with a field Contour which indicates the elevation in meters above sea level)
- Vegetation, (a polygon Shapefile of vegetation polygons containing information only about the area and perimeter of each polygon and a unique identifier)

Carefully examine the data set and answer all the following questions.

1. The total cost of the project is 140 million Rand. Calculate how much the new freeway will cost per meter of freeway length? [2 Marks]
2. Traffic on the new freeway is reasonably expected to affect natural ecosystems up to 200 metres away through noise, and pollutants like lead and benzene. What is the exact length of streams that are likely to be affected? [2 Marks]
3. Tabulate and summarize the areas of the different native vegetation types affected by increasing pollution from the new freeway i.e. falling within 200 metres of the new freeway. [5 Marks]