



**UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER**

PROGRAMME: MSc in ENVIRONMENTAL RESOURCE

COURSE CODE: ERM 602

**TITLE OF PAPER: GIS FOR ENVIRONMENTAL RESOURCE
MANAGEMENT**

TIME ALLOWED: THREE (3) HOURS

SPECIAL MATERIAL REQUIRED: NONE

INSTRUCTIONS: ANSWER ANY FOUR QUESTIONS

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN
GRANTED BY THE CHIEF INVIGILATOR**

Question 1.

Discuss how the Normalised Difference Vegetative Index (NDVI) for an area is developed, highlighting the data needed as well as the steps followed in developing it. Also describe how the index can be used to separate areas of land cover and vegetation status. (25 marks).

Question 2.

Discuss the components of GIS, describing how availability of some of the components can affect the use of GIS for land resource management in developing countries. (25 marks)

Question 3.

GIS is used by a number of organisations and institutions such as utility companies, transportation companies, farmers and forestry companies. Describe the conditions that make some of the institutions need to use GIS, highlighting the problems that the GIS can help to solve. (25 marks).

Question 4.

Describe the process that would be followed when planning and implementing a GIS project to solve an environmental problem of your choice, specifying the type of data to be used, the source of such data, and the equipment needed to undertake such project. (25 marks).

Question 5.

Describe how a map of land features can be produced by on-screen digitising from satellite data, indicating how the raster GIS (satellite data) can be linked with vector GIS. Give examples of software needed for both raster GIS and vector GIS. Also specify the format of vector data that would be shown on the resultant map (vector map). (25 marks).