



# MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2015/2016

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL STUDIES

FIRST SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN  
ENVIRONMENTAL STUDIES

ERC 215: NATURAL RESOURCE MAPPING & CARTOGRAPHY

Date: 22/4/2016

Time: 8.30-10.30 AM

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## INSTRUCTIONS

*This paper consists of FIVE questions*

*Answer question one and other two questions in this paper*

1. a) Define the following;
  - i) Geographical Information Systems (2 marks)
  - ii) Geographic Information Science (2 marks)
  - iii) Describe the five components of a GIS (5 marks)
- b) Differentiate between attribute and spatial components of Geospatial data. (3 marks)
- c) Explain the following methods of data entry in a GIS
  - i) On-tablet digitizing (2 marks)
  - ii) On-screen digitizing (2 marks)
- d) Account for the following terms;
  - i) Raster data models (2 marks)
  - ii) Vector data models (2 marks)
- e) Outline six sources from which GIS data can be compiled (3 marks)

- f) Explain three (3) differences between GIS and Manual Cartographic map products (3 marks)
- g) Describe the use of GIS in mapping forest resources (4 marks)
2. a) Explain the following sources of mapping data
- i) Terrestrial Surveys
  - ii) Environmental data files
  - iii) Existing digital boundary files
  - iv) Photogrammetric surveys (20 marks)
3. a) Account for the term 'Map projections' as used in a GIS (2 marks)
- b) Differentiate between geographic coordinate system and projected co-ordinate systems. (4 marks)
- c) Define the role of a co-ordinate system in GIS mapping (2 marks)
- d) Classify map projections in accordance to their inherent properties (12 marks)
4. a) i) You have been instructed to carry out a GIS project, what model would you prefer? Raster or Vector and why? (5 marks)
- ii) Explain the word Topology in the context of a GIS. (3 marks)
- b) Using appropriate diagrams, describe the following methods of topological representations
- i) Spaghetti
  - ii) Topological
  - iii) Topological warped (12 marks)
5. Describe how GIS is useful in mapping the following,
- i) Soil type
  - ii) Crop coverage
  - iii) River/Tributary mapping
  - iv) Land use
  - v) Existing irrigation systems (20 marks)