



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

**FIRST SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN
INFORMATION TECHNOLOGY**

SCO 417: GEOGRAPHIC INFORMATION SYSTEMS

Date: 2/8/2016

Time: 8:30 – 10:30 AM

INSTRUCTIONS

*This paper consists of FIVE questions
Answer question ONE and other TWO questions in this paper.*

QUESTION ONE (30 MARKS)

- a) Define the following terms:
 - i) Arc-toolbox (2 marks)
 - ii) Geographic information systems (2 marks)
 - iii) Arc-info (2 marks)
 - iv) Geo-processing (2 marks)
- b) Differentiate between the spaghetti and Topological data structures as applied in vector data model. (4 marks)
- c) Briefly differentiate between the raster and vector data models of representing geographical phenomena in GIS. (4 marks)
- d) ArcGIS, ArcView and ArcEditor are organized into modules, outline the main modules in ArcGIS. (3 marks)

- e) Describe two ways of manually digitizing paper maps. (4 marks)
- f) Spatial analysis is at the very heart of geographic information system (GIS) technology. Define spatial analysis and with an aid of an example in each case, discuss three categories of spatial analysis. (7 marks)

QUESTION TWO – 20 MARKS

- a) During the process of data capture processing and even output in GIS, several errors may arise in the resultant spatial and attribute data. Briefly outline on the sources/causes of these errors that may eventually affect the quality of the final GIS product. (8 marks)
- b) Discuss the different data capturing methods from various sources commonly used in a GIS (12 marks)

QUESTION THREE – 20 MARKS

- a) What are the relative merits and demerits of the vector data structures as encountered in GIS. (10 marks)
- b) Explain the major functions of GIS. (10 marks)

QUESTION FOUR – 20 MARKS

- a) Differentiate between a data model and a data structure as used in geospatial information systems. (6 marks)
- b) Discuss the components of geographical information systems. (10 marks)
- c) Briefly explain the term topology as used in GIS. (4 marks)

QUESTION FIVE – 20 MARKS

- a) Identify and explain five components to data quality in the context of GIS. (10 marks)
- b) Discuss five Important GIS Applications and Uses (10 marks)