



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 417: GEOGRAPHIC INFORMATION SYSTEMS

DATE: 3/5/2019

TIME: 11.00-1.00 PM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- a) Define the following terms as used in Geographic Information system.
 - i. Arc Map (2 marks)
 - ii. 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 structures of representing geographical phenomena in GIS. (4 marks)
- d) Outline the procedure of digitizing a map using Arc Map in ArcGIS. (6 marks)
- e) ArcGIS, ArcView and ArcEditor are organized into modules, outline the main modules in ArcGIS (6 marks)
- f) Describe the **two** categories of geographic information system analysis functions. (4 marks)
- g) Explain why rasterization of vector data is sometimes required in data preparation. (2 marks)

QUESTION TWO (20 MARKS)

- a) Outline the three ways of creating geodatabase in geographic information system (6 marks)
- b) Discuss four different data capturing methods from various sources commonly used in a GIS (8 marks)
- c) Define the following Geodatabase elements as used in Arcgis. (6 marks)
 - i. Feature classes
 - ii. Relationships
 - iii. Geometric network

QUESTION THREE (20 MARKS)

- a) State three merits and three demerits of the vector data models as encountered in GIS. (6 marks)
- b) Explain how GIS can be a decision support system (4 marks)
- c) Discuss any five benefits of geographical information systems (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 five components of geographical information systems. (10 marks)
- c) Explain the four types of resolutions for remote sensing systems (4 marks)

QUESTION FIVE (20 MARKS)

- a) Describe the parts of Arc map geographical interface using a diagram. (8 marks)
- b) Discuss the application of GIS in power grid management. (5 marks)
- c) Outline the process of creating and editing new spatial data files in arc map. (5 marks)
- d) Explain how Meta data is used to solve problems in GIS (2 marks)