



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DEGREE IN
BACHELOR OF SCIENCE IN COMPUTER SCIENCE

SCO 417: GEOGRAPHIC INFORMATION SYSTEMS

DATE: 2/6/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Questions ONE and Any Other Two Questions

QUESTION ONE (30 MARKS)

- a) Define the following terms as used in Geographic Information system.
 - i. Geo- visualization (2 marks)
 - ii. Geo-processing (2 marks)
- b) Differentiate between the Run length encoding and block coding data structures as applied in raster data model. (4 marks)
- c) Briefly differentiate between the raster and vector data structures of representing geographical phenomena in GIS. (4 marks)
- d) Discuss the two types of data used to represent geographic features in GIS. (6 marks)
- e) Differentiate between the following:
 - i. Image and raster (2 marks)
 - ii. Scale and resolution (2 marks)
- f) Describe the **two** categories of geographic information system analysis functions. (6 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 the 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)