

MACHAKOS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

UNIT NAME: GEOGRAPHIC INFORMATION SYSTEMS

UNIT CODE: SCO 417

SEMESTER:

DATE:

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and Any Other TWO Questions.

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. Outline the procedure for creating a map of railway route from one point to another including the buildings adjacent to the rails. There should be a minimum of three layers. [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]