



# **MACHAKOS UNIVERSITY**

**University Examinations for 2018/2019**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY**

**FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR**

**BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)**

**SCO 417: GEOGRAPHIC INFORMATION SYSTEMS**

**DATE: 27/9/2019**

**TIME: 11.00-1.00 PM**

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## **INSTRUCTIONS**

### **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]