



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

**SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS
UNIVERSITY EXAMINATIONS: 2013/2014
ICT 2212: FUNDAMENTALS OF GIS
KISUMU LEARNING CENTER**

DATE: DECEMBER 2013

TIME: 2 HOURS

INSTRUCTIONS:

**Answer ALL QUESTIONS IN SECTION A AND ANY TWO FROM SECTION B
SECTION A (COMPULSORY- 30 Marks)**

QUESTION ONE 30 Marks

- a) Explain the meaning of the following geographic concepts;
- i. GIS {2 Marks}
 - ii. Attribute data {2 Marks}
 - iii. Remote sensing {2 Marks}
 - iv. Spatial referencing {2 Marks}
- b) Briefly discuss any three approaches towards the modeling of surface entities {6 Marks}
- c) Identify three major spatial entities used for representation in GIS {6 Marks}
- d) Establish the benefits of using a GIS in the place of paper maps {4 Marks}
- e) Discuss the effectiveness of raster data obtained from satellite images

{6 Marks}

QUESTION TWO 20MARKS

- a) Define the following concepts as used in GIS data analysis;
- i) Network analysis {2 Marks}
 - ii) Aspatial query {2 Marks}
 - iii) Buffering {2 Marks}
- b) All GIS data must be presented using three modes or dimensions. Identify these modes {3 Marks}
- c) Using your practical knowledge, describe the procedure for accomplishing the following tasks;
- i) Changing the projection of a GIS project {3Marks}
 - ii) Geo-referencing an entity {4Marks}
 - iii) Digitizing a map {4 Marks}

QUESTION THREE 20MARKS

- a) Discuss two approaches to 3D modeling in GIS {4 Marks}
- b) Identify any four functions of a GIS application {4 Marks}
- c) Describe the logical steps necessary to put a GIS to work using a diagram. {4 Marks}
- d) Many GIS applications are in existence today, both commercially and in open source. List the various types of these applications {2 Marks}
- e) Give the meaning of the following terms
- i) TIN {2 Marks}
 - ii) DEM {2 Marks}
 - iii) UTM {2 Marks}

QUESTION FOUR 20MARKS

As a GIS consultant, you have been contacted by the Ministry of Health to help them establish a mobile GIS unit whose primary purpose will be to manage and contain any outbreak of infectious diseases in the country.

- a) Discuss how GIS can be used in infectious disease management and control {10 Marks}
- b) Explain the criteria you will recommend to the Ministry of Health as regards the acquisition of GIS technology for infectious disease management and control. {10 Marks}

Hint: Recall this is a mobile unit. Disease outbreaks do occur at times in very remote places. Technology should thus also consider mobility and information distribution

QUESTION FIVE 20MARKS

- a) With examples discuss the main features that characterize topology {6 Marks}
- b) Discuss the benefits of using a database for GIS attribute data management {3 Marks}
- c) The following table shows records of tenants to leased land parcels. Study it and then attempt the questions that follow;

LEASE

Parcel ID	Location	Owner	LeaseStart	LeaseEnd	Rent
GOV03456	Bondo	Eunice Atieno	01/01/2008	01/01/2011	400,200
GOV03457	Bondo	Emily Omollo	04/05/2009	03/05/2011	200,000
GOV03458	Bondo	Janyabondo P	01/11/2009	03/11/2014	150,700
GOV03459	Bondo	Okoth Jarangi	02/10/2010	02/10/2014	630,000
GOV03460	Kisumu	Wuod Penina	05/10/2010	04/10/2011	20,000

Write SQL statements to retrieve the following records;

- i) The parcel numbers and owner names of all leased parcels {3 Marks}
- ii) The records whose lease(s) has expired {2 Marks}
- iii) All lease information with a rent higher than 200,000 {3 Marks}
- iv) The parcel numbers, owner names and rent of parcels in Bondo {3Marks}