



**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}