



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF SPATIAL PLANNING AND NAURAL RESOURCE MANAGEMENT
UNIVERSITY EXAMINATIONS FOR SECOND YEAR FIRST SEMESTER
EXAMINATIONS IN 2021/2022 ACADEMIC YEAR FORTHE DEGREE OFBACHELOR
OF ARTS IN SPATIAL PLANNING, BACHELOR OF SCIENCE IN WATER
RESOURCES AND ENVIRONMENTAL MANAGEMENT; AND BACHELOR OF
SCIENCE IN RENEWABLE ENERGY.

MAIN CAMPUS

COURSE CODE: PPB 1207

COURSE TITLE: GEOGRAPHIC INFORMATION SYSTEMS
EXAM SESSION:

DATE:

DURATION: 2 HOURS

EXAM VENUE:

INSTRUCTIONS

1. This paper contains FIVE (5) questions
2. Answer question 1 (Compulsory) and ANY other 2 Questions
3. Write all answers in the booklet provided

Question 1

- (a) Deduce key features of Geographic Information Systems (GIS) from its definitions. (4 marks)
- (b) “Geographic phenomenon= Field, Object, Boundary”. By using relevant examples, explain this statement. (6 marks)
- (c) With the aid of relevant sketches, explain how point, linear, polygon and raster data are represented (or modelled) in GIS software. (10 marks)
- (d) Explain preference of satellite imagery as a source of data in GIS. (4 marks)
- (e) ArcGIS is a globally acclaimed commercial GIS software by ESRI. Describe ArcGIS applications modules. (6 marks)

Question 2

- a) Describe GIS software component and its sub-systems. (8 marks)
- b) Briefly discuss relational database model in GIS.(6 marks)
- c) You are commissioned to develop GIS database for schools in your ward. Identify key attribute data you will incorporate. (6 marks)

Question 3

- a) Using suitable diagrams to illustrate your answer, explain the following vector data models
 - i) Spaghetti Model (3 marks)
 - ii) Topological Model (3 marks)
 - iii) TIN (3 marks)
- b) Outline the process of vector data capture and editing from a remote sensing image.(6 marks)
- c) With the aid of a sketch, describe elements of map production as a geo-visualization output of GIS works. (5 marks)

Question 4

- a) Why is spatial analysis the crux of GIS?(6 marks)
- b) You are commissioned to analyse physical access to domestic water supply sources/points. Water inaccessibility is spatially defined as “any household not-

within-200m from water access point/source”. Identify and describe spatial analysis you will apply to discover under-served areas for interventions. (8 marks).

c) Explain topological relationships with respect to vector data in GIS? (6 marks)

Question 5

Use the diagram below to answer the following questions

- i) Identify the diagram with respect to GIS Data Modelling of the real-world complexities. (4 marks)
- ii) Identify raster and vector datasets in the diagram. (6 marks)
- iii) The features represented in the diagram are defined by a common geography. Explain how this is achieved in terms of datum, map projections and coordinate reference systems. (10 marks)

