



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF PUBLIC HEALTH
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
IN PUBLIC HEALTH AND BACHELOR OF SCIENCE IN
COMMUNITY HEALTH AND DEVELOPMENT
SEMESTER 2022/2023 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: PPB1305

COURSE TITLE: SPATIAL DATA ANALYSIS IN PLANNING

EXAM VENUE:

STREAM: PUBLIC HEALTH

DATE:

EXAM SESSION:

TIME: 2 HOURS

Instructions:

- 1. Answer question 1 (compulsory) and ANY other 2 questions.**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A (30 MARKS)

Questions One

- a) Describe the following concepts in relation to spatial data analysis
- i. Spatial data [2 marks]
 - ii. Spatial patterns [2 marks]
 - iii. Spatial autocorrelation [2 marks]
 - iv. Network analysis [2 marks]
 - v. Terrain analysis [2 marks]
- b) Describe different geoprocessing operations applicable prior to any prospective spatial data analysis initiative. [8 marks]
- c) With relevant examples in real life, discuss topological relationships which can be modelled with respect to vector data. [6 marks]
- d) Discuss the application of Thiessen polygon with respect to healthcare planning. [6 marks]

SECTION B (40 MARKS)

Question Two

- a) What is a surface? [2 marks]
- b) Briefly discuss different techniques of creating or analysing a surface. [10 marks]
- c) In an urban context, identify spatial data/information that can be displayed or analysed as a surface [8 marks]

Question Three

- a) Giving examples in each case, differentiate between utility network and transport networks. [4 marks]
- b) Briefly explain elements of a network dataset. [6marks]
- c) Discuss different types of network analysis. [10 marks]

Question Four

- a) Differentiate between density-based and distance-based pattern analysis. [4 marks]
- b) Explain types of density-based pattern analysis that can be applied to ward-based population analysis. [8 marks]
- c) Outline topological rules with respect to vector data model. [8 marks]

Question Five

You are commissioned to identify air pollution hotspot (s) within a city:

- a) Which areas will you most likely find air pollution hotspots? [4 marks]
- b) Which data will you need? [4marks]
- c) Explain spatial data analysis technique you will apply for the hotspot analysis? [4 marks]
- d) Describe the step-by-step procedure (workflow) you will apply the spatial data analysis techniques to accomplish the task [8 marks]