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

**SCHOOL OF SPATIAL PLANNING**

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN PUBLIC HEALTH AND BACHELOR OF SCIENCE IN COMMUNITY HEALTH SEMESTER 2016/2017 ACADEMIC YEAR**

# CENTRE: KISUMU LEARNING CENTRE

**COURSE CODE:** PSP 3325

**COURSE TITLE:** SPATIAL DATA ANALYSIS IN PLANNING

**EXAM VENUE:**                          **STREAM: SPATIAL PLANNING**

**DATE:**                                     **EXAM SESSION:**

**TIME: 2 HOURS**

<u>**Instructions:**</u>

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.**

## Question 1

(a) Using suitable diagrams, explain how raster data differs from vector data     (5 marks)

(b) Explain any five barriers to data layering in a GIS.     (10 marks)

(c) Draw diagrams showing:
      i.     A point circular buffer,     (3 marks)
      ii.     A line variable buffer,     (3 marks)
      iii.     An area exterior variable buffer     (3 marks)

(d) A confusion (error) matrix can be used to analyse the relationship between known reference data (truth) and the corresponding results of a classification. Use the matrix provided below to calculate

| | | True data | | | | |
|---|---|---|---|---|---|---|
| | | Water | Bare Soil | Grassland | Forest | |
| Classification | Water | 12 | 1 | 1 | 0 | |
| | Bare soil | 1 | 14 | 0 | 0 | |
| | Grassland | 1 | 2 | 10 | 4 | |
| | Forest | 0 | 0 | 4 | 12 | |
| | | | | | | |

    (i)     Overall Accuracy     (2 Marks)
    (ii)     Error of commission grassland     (2 Marks)
    (iii)     Error of omission for grassland     (2 Marks)

## Question 2

(a) Explain how to test a model for accuracy using the cross-validation method     (10 marks)
(b) State five reasons for modelling according to Winterhalder (2002)     (10 marks)

## Question 3

(a) Explain five factors that should be considered when choosing a Interpolation Model
    (10 marks)
(b) Explain any five causes of uncertainty in GIS modelling     (10 marks)

## Question 4

(a) Explain the concept of "Crowdsourcing" as used in GIS     (10 marks)
(b) Explain any five limitations of modelling in GIS     (10 marks)

## Question 5

Kisumu City Council wishes to identify land owners who have encroached on the riparian corridors along the River Nyamsaria as it enters Lake Victoria. You are asked to produce a map that delineates these riparian areas, and produce a table that shows landowners who have encroached into these areas. To do this task you are provided with the following data; a network map of streams, a polygon map of the lake, and a polygon map of land parcels.
Create a cartographic model for the problem above     (20 marks)