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**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**

**3RD YEAR 1ST 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: 20/04/17 EXAM SESSION: 2.00 – 4.00PM**

**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.**

**Question 1**

1. Using suitable diagrams, explain how raster data differs from vector data (5marks)
2. Explain any five barriers to data layering in a GIS. (10 marks)
3. Draw diagrams showing:
4. A point circular buffer, (3 marks)
5. A line variable buffer, (3 marks)
6. An area exterior variable buffer (3 marks)
7. 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 | | | | | |
| Classification data |  | Water | Bare Soil | Grassland | Forest |  |
| Water | 12 | 1 | 1 | 0 |  |
| Bare soil | 1 | 14 | 0 | 0 |  |
| Grassland | 1 | 2 | 10 | 4 |  |
| Forest | 0 | 0 | 4 | 12 |  |
|  |  |  |  |  |  |

1. Overall Accuracy (2 Marks)
2. Error of commission grassland (2 Marks)
3. Error of omission for grassland (2 Marks)

**Question 2**

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

**Question 3**

1. Explain five factors that should be considered when choosing a Interpolation Model

(10 marks)

1. Explain any five causes of uncertainty in GIS modelling (10 marks)

**Question 4**

1. Explain the concept of “Crowdsourcing” as used in GIS (10 marks)
2. 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)