



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF THE BUILT ENVIRONMENT
DEPARTMENT OF PROPERTY STUDIES AND URBAN DESIGN
MASTER OF URBAN DESIGN
GEOGRAPHICAL INFORMATION SYSTEMS
BUD 6205

Main Examination Paper

AUGUST 2024

This examination paper consists of 3 pages.

Time Allowed: 3 hours.

Total Marks: 100

Special Requirements: Laptops

ArcGIS 10.8 software and or any other software available

Data sets, GPS coordinates, and Zimbabwe Scanned Maps

Examiner's Name: MR T. MADYANGOVE

INSTRUCTIONS

1. Answer **FOUR** questions. Question 1 is **compulsory**, so choose ANY other **THREE (3)**.
2. Each question carries 20 marks except question ONE (1).
3. Start your answer to each question on a fresh page.

QUESTION 1

A reputable NGO has asked you to assist in distributing health services in 3 provinces. Based on the collected GPS data, some districts were targeted to initiate the program, with a minimum of two wards being chosen. You are to;

- a). Show the areas to be intervened in on a map and digitise critical information that is suitable to support health activities **[10 marks]**
- b). Examine the site suitability of the said area using interpolation to determine its suitability to sustain health **[10 marks]**
- c). Using map hotspots, determine the area where there is a concentration of health activities **[20 marks]**

[Total marks 40]

QUESTION 2

Zimbabwe has been experiencing adverse weather patterns that have caused severe destruction of properties and loss of life in most towns. The Department of Civil Protection has collected data on one area, and we are asking you to assist with tabulating the data. Using the data, create a flood map in the said area using GIS software you are familiar with

[Total marks 20]

QUESTION 3

WFP has been working extensively to assist people in some parts of a particular province in Zimbabwe affected by a severe food shortage. They have asked you to assist with tabulating their information and producing maps using GIS. Thus, they have asked you to;

- a). Produce a map determining the best sites to use food distribution points within the districts they are working in. **[10 marks]**
- b). Use the point distance analysis to indicate the distances the recipients will travel to the distribution points. **[5 marks]**
- c). Show the most vulnerable area using population density **[5 marks]**

[Total marks 20]

QUESTION 4

You have been furnished with GPS coordinates, Raster Maps, and relevant vector data sets. From the available data, you are to generate a map by digitising critical

information using GIS to assist the community in preparing for any disasters in the area.

- a. Examine land use using simple overlay analysis in two selected wards. **[18 marks]**
- b. Determine the likelihood of GPS-tagged homesteads that are vulnerable to any possibility of a natural disaster using buffering as 0.08km **[2 marks]**

[Total marks 20]

QUESTION 5

Zimbabwe has been experiencing waterborne-diseases in its major cities and some parts of rural Manicaland. The outbreaks have caused deaths, over-stretched the health sector, and severe economic losses for individuals, companies, and the nation. They have hired you to assist with;

- a). The creation of a hotspot map for two districts showing the distribution of the outbreak according to the GPS coordinates **[15 marks]**
- b). The determination of the distribution of health facilities for the said wards experiencing an outbreak and cluster them at a radius of 0.06km **[5 marks]**

[Total marks 20]

QUESTION 6

You have just started work at the United Nations Development Programme (UNDP) offices in Harare, Zimbabwe, and your region of responsibility is Masvingo Province. Use ArcGIS and/or any GIS software you are familiar with to illustrate the Land Use and Change Cover of any two districts based on the given raster data.

[Total marks 20]

END OF EXAMINATION