



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

MAIN CAMPUS

UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER EXAMINATIONS

**MAIN EXAMINATION**

FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN DISASTER PREPAREDNESS AND ENVIRONMENTAL  
TECHNOLOGY  
&  
BACHELOR OF SCIENCE IN DISASTER MITIGATION AND SUSTAINABLE  
DEVELOPMENT

**COURSE CODE: DPE 307**

**COURSE TITLE: GEOGRAPHIC INFORMATION SYSTEMS AND  
REMOTE SENSING I**

**DATE: 14/4/2023**

**TIME: 8-10 AM**

---

**INSTRUCTIONS TO CANDIDATES**

- This paper contains **four (4)** questions.
- Question **one (1)** is compulsory {total = 30 Marks}.
- Attempt **any other two (2)** {total = 40 Marks} from the remaining questions.
- Be brief and to the point.

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over ⇒

**SECTION I: COMPULSORY {30 MARKS}**

### Question ONE

- a) Using a schematic diagram, outline the logical steps necessary for putting a GIS to work. [8 Marks]
- b) Highlight three [3] main software components that constitute ESRI's ArcGIS [8Marks]
- c) State the merits and demerits of representing geographic phenomena in the vector data structure as encountered in GIS. [8 Marks]
- d) Explain the following terminologies as used in GIS spatial analysis.
  - i) Buffering [2 Marks]
  - ii) Attributes [2 Marks]
  - iii) Topology [2 Marks]

### SECTION II: ATTEMPT ANY OTHER TWO (2) QUESTIONS {40 MARKS}

#### Question TWO

- a) Data is possibly the most important component that determines the reliability of any GIS analysis results. Explain any four factors that affects the quality of spatial data [8 Marks]
- b) Describe the process of capturing and processing the spatial data to build a raster database. Use an illustrative diagram [6 Marks]
- c) Differentiate between the following analytical functions of a GIS
  - i. Measurements and spatial query functions [2 Marks]
  - ii. Overlay and Neighborhood functions [2 Marks]
  - iii. Network and 3D spatial data functions [2 Marks]

#### Question TREE

- a) People are a key component of any GIS, explain the categories of people associated with GIS [10 Marks]
- b) Highlight the role of GIS and Remote Sensing in management of the following disasters
  - i. Floods [5 Marks]
  - ii. Fire [5 Marks]

#### Question FOUR

- a) Discuss the characteristics of Remote Sensing that make Remote Sensing data ideal for different applications [8 Marks]
- b) Explain the two conceptual models that represent what occupies or occurs in a geographic space, stating how these may be represented in Geographical Information Systems. [7 Marks]
- c) Distinguish between a query by location and a query by attribute as used in GIS spatial analysis [5 Marks]