



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

**UNIVERSITY SPECIAL EXAMINATION 2022/2023**

**SECOND YEAR FIRST SEMESTER EXAMINATION FOR**

**BSC IN WATER RESOURCES AND ENVIRONMENTAL MANAGEMENT;**

**BACHELOR OF SPATIAL PLANNING AND DESIGN;**

**BSC IN PUBLIC HEALTH;**

**BSC IN COMMUNITY HEALTH AND DEVELOPMENT; AND**

**BSC IN RENEWABLE ENERGY**

**BSc ICT**

## **MAIN CAMPUS**

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**COURSE CODE:** PPB 1207

**COURSE TITLE:** GEOGRAPHIC INFORMATION SYSTEMS

**EXAM SESSION:**

**DATE:**

**DURATION:** 2 HOURS

**EXAM VENUE:**

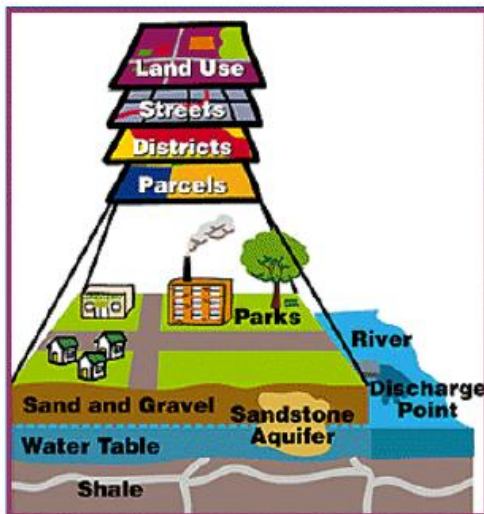
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### **INSTRUCTIONS**

- 1. This paper contains FIVE (5) questions**
- 2. Answer question 1 (Compulsory) and ANY other 2 Questions**
- 3. Write all answers in the booklet provided**

## Question One

- a) Briefly describe the following concepts in relation to Geographic Information Systems (GIS). (10 marks)
- i. Spatial data (2 marks)
  - ii. Attribute data (2 marks)
  - iii. Vector Data (2 marks)
  - iv. Raster Data (2 marks)
  - v. Data capture (2 marks)
- b) GIS components are not the same as GIS functions. Explain. (10 marks)
- c) GIS is applicable in diverse areas. Discuss this statement with focus on your area of study (6 marks)
- d) Explain the diagram below in relation to GIS data. (4 marks)



## Question Two

- a) “A spatial database holds a digital representation of the real world. Among spatial data models, we can distinguish two major types, field and object-based models”. Giving appropriate examples, describe the object-based model and field-based model in GIS. (8 marks)
- b) With the aid of a diagramme, describe how GIS software represent or store point, line and a polygon data. (6 marks)

- c) Identify editing error in vector data captured through on-screen vectorization. (6 marks)

### Question Three

- a) With the aid of sketches, differentiate between vector data structure and raster data structure (6 marks)
- b) Universal Traverse Mercator (UTM) projection is most appropriate for Kenya. Explain. (4 marks)
- c) Discuss basic map elements in map production (10 marks)

### Question Four

- a) "GIS is at the heart of Geographic Information System. Explain. (2 marks)
- b) Describe each of the following types of GIS analysis.
- i. Spatial measurements (3 marks)
  - ii. Information searches (or selection) (3 marks)
  - iii. Spatial buffering (3 marks)
  - iv. Spatial overlays (3 marks)
- c) Outline GIS analysis procedure. (6 marks)

### Question Five

- a) Describe advantages of relational database in modeling attribute data. (4 marks)
- b) You have been tasked to capture data about water points within Bondo Town. Describe possible attribute data you will include in a relational database. (10 marks)
- d) Discuss the benefits of adopting GIS technology into an organization. (6 marks)