DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY EXAMINATIONS 2021/2022

Fifth Year First Semester Examination for the Degree of
Bachelor of Science in Civil Engineering

GGI 4203: Introduction to GIS and Remote Sensing

Date: April 2022	Time: 2 Hours

INSTRUCTIONS: Answer **question one** and any **two questions**

Question One [30 marks]

(i)   Define the following terms:

        a) Geographic information System(GIS)

        b) Remote Sensing   [**4 marks**]

(i)   Elucidate the two conceptual models of representing of what is occupying or occurring in a geographic space.   [**6 marks**]

(ii)   Explain the two models that are used to describe the electromagnetic energy.   [**4 marks**]

(iii)   List and briefly explain the three types of atmospheric scattering of the electromagnetic radiation. scattering   [**6 marks**]

(iv)   Outline five application areas of GIS and Remote Sensing   [**10 marks**]

Question Two [20 marks]

(i)   Briefly differentiate between the raster and vector data models of representing geographical phenomena in GIS.   [**6 marks**]

(ii)   Explain the term **topology** as used in GIS.   [**4 marks**]

(iii)   What are the factors that affect the quality of GIS data and its products?   [**10 marks**]

Question Three [20 marks]

(i)Give five ways on how remote sensing can complements ground survey methods. [**5 marks**]

(ii)Briefly outline the components that make up a geographic information system   **15 marks**]

Question Four [20 marks]

(i)   Expound the terms listed here below as used in the context of geographical information systems and/or remote sensing

a) Atmospheric window

b) Georeferencing

c) Systematic data collectors   **[8 marks]**

(ii)   Describe the capture and processing of spatial data to build a GIS-for a transportation planning application   **[12 marks]**

Question Five [20 marks]

(i)Describe the remote sensing process.   **[10 marks]**

(ii)Give the relative merits and demerits of the vector data models/structures?   **[10 marks]**