DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

UNIVERSITY EXAMINATIONS 2021-2022
FOR THE DEGREE IN MASTER OF SCIENCE IN GEOTHERMAL ENERGY TECHNOLOGY

GET 3006: GEOMATICS & GEOSPATIAL APPLICATION IN GEOTHERMAL ENERGY EXPLORATION

DATE: TIME: 3 HOURS

INSTRUCTIONS
1) TIME ALLOCATED – 3 hours
2) There are FIVE QUESTIONS in this paper
3) Attempt only THREE questions
4) Question 1 is compulsory and is worth 30 marks. The other two are 15 marks each
5) This Paper will count for 60% of the total score of GET 3006 The other 40% will be earned from CATS and assignments

Question 1 [30 marks] – This question is Compulsory

a. Giving examples, discuss the terms "sensors" and "platforms" as used in remote sensing. *(5marks)*
b. Briefly describe the Components of a GIS system. *(5 marks)*
c. Briefly describe the three important characteristics of the connections in a GIS system between Graphic (spatial) and tabular (descriptive) data. *(5 marks)*
d. Describe the term "atmospheric window "as used in remote sensing. *(5 marks)*
e. Briefly describe the wave and particles theories used in remote sensing indicating the use of each. *(5 marks)*
f. Differentiate between supervised and unsupervised classification as used in remote sensing. *(5 marks)*

Question 2 [15 marks] – This question is Optional

a. Discuss five data capture methods used to get data into a GIS system applicable to geothermal resource surveys. *(5 marks)*
b. Differentiate between vector and raster data structures giving at least two advantages and disadvantages of each. *(5 marks)*
c. Given what role a satellite image could play in the identification of a potential geothermal exploration site. *(5 marks)*

Question 3 [15 marks] – This question is Optional

a) You have been assigned the task of identifying potential areas for geothermal resources provide a step-by-step process on the use of GIS and Remote Sensing to establish the suitable site. *(8 marks)*
b) Discuss the essential steps used in hazard mitigation leading to the generation of a hazard map. *(7 marks)*

Question 4 [15 marks] – This question is Optional

a) Discuss any five multiband operations used to enhance images prior to classification. *(10 marks)*
b) Discuss the terms Spatial and contrast enhancements as used in remote sensing data processing. *(5 marks)*

Question 5 [15 marks] – This question is Optional

a. Explain four types of interactions between electromagnetic spectrum and atmosphere. *(4 marks)*
b. Differentiate between active and passive satellite sensor systems in remote sensing. *(3 marks)*
c. Discuss the various types of resolution used in remote sensing. *(8 marks)*