DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

GEOTHERMAL ENERGY TRAINING AND RESEARCH INSTITUTE
MSc IN GEOTHERMAL ENERGY TECHNOLOGY

SPECIAL EXAMINATIONS

GET 4102: GIS APPLICATIONS IN GEOSCIENCES

DATE: TIME: 3 HOURS

INSTRUCTIONS

1)   TIME ALLOCATED – 3 hours

2)   There are FIVE QUESTIONS in this paper

3)   Attempt THREE questions

4)   Question 1 is compulsory and worth 30 marks. The other two questions have equal marks of 15 each

5)   This Paper will count for 60% of the total score of GET 4102. The other 40% will be earned from CATS and assignments

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Question 1 *[30 marks] – This question is Compulsory*

a.   Briefly describe GIS components   *[5 Marks]*

b.   Differentiate spatial data from other types of data   *[2 Marks]*

c.   Briefly describe the spatial data structures   *[4 Marks]*

d.   Define the following terms: *[4 Marks]*

   i. Attributes

   ii. Features

e.   Distinguish between Geographic and Projected coordinates   *[5 Marks]*

f.   Briefly describe the three topological concepts of spatial data   *[5 Marks]*

g.   Briefly state two relative strengths and weakness of raster and vector data in GIS *[5 Marks]*.

Question 2 *[15 marks] – This question is Optional*

a.   Describe any six (6) techniques of spatial vector data acquisition   *[8 Marks]*

b.   Describe any four (4) methods of spatial analysis   *[7 Marks]*

Question 3 [15 marks] – This question is Optional

a) Describe the important characteristics of the connections between Graphic (spatial) and tabular (descriptive) data in a GIS system   *[5 Marks]*

b) Discuss GIS functions as used in a GIS system   *[10 Marks]*

Question 4 [15 marks] – This question is Optional

a) Briefly describe the spatial analysis chain   *[8 Marks]*

b) You have been assigned the task of identifying suitable sites for geothermal exploration by your unit head. State the steps you will take from compilation of relevant data to establishing the suitable sites in a GIS system   *[7 Marks]*

Question 5 [15 marks] – This question is Optional

a) Giving examples, briefly describe five areas of GIS application in the various disciplines

[5 Marks]

b) When you acquire a particular data set of interest, it is rarely in the exact form that is needed during analysis, briefly describe at least five data preparation procedures

[10 Marks]