



DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

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

GET 3002: GEOLOGY 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 3002 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 indicator volcanic product deposits found in geothermal potential areas. *(5 marks)*
- b. Briefly describe the different types of magma found in geothermal settings. *(5 marks)*
- c. Briefly describe the basic geological structures within the rift valley useful in geothermal resource exploration. *(5 marks)*
- d. Briefly describe the use of geology in Identification of geothermal area. *(5 marks)*
- e. Briefly describe the different classes of rocks in geology and their formation processes. *(5 marks)*
- f. Briefly describe the major geological plate margins and their importance in geothermal exploration. *(5 marks)*

Question 2 [15 marks] – This question is Optional

- a. Discuss the various hydrothermal alterations zones and its use in understanding the behaviour of a geothermal reservoir. *(7 marks)*
- b. Discuss at least five physical properties of minerals. *(8 marks)*

Question 3 [15 marks] – This question is Optional

- a. Discuss the various alteration minerals occurring geothermal sites stating their importance in exploration. *(7 marks)*
- b. Describe the various geothermal fluid types. *(8 marks)*

Question 4 [15 marks] – This question is Optional

- a. Discuss the various types of energy and their contribution to earth processes. *(5marks)*
- b. Discuss the various sources of heat in the earth and their transfer modes. *(3 marks)*
- c. Briefly describe the difference between effusive and explosive volcanic eruptions giving their compositional characteristics. *(7 marks)*

Question 5 [15 marks] – This question is Optional

- a. Describe the natural hazards in volcanic and geothermal areas and their potential environmental impact. *(5 marks)*
- b. Briefly describe the various methods used in geothermal exploration. *(5 marks)*
- c. Discuss the different geothermal energy sources. *(5 marks)*