UNIVERSITY OF ESWATINI

INSTITUTE OF POSTGRADUATE STUDIES

FINAL EXAMINATION, DECEMBER 2019

MSc. E.R.M.

TITLE OF PAPER: GEOGRAPHIC INFORMATION SYSTEMS

COURSE NUMBER: GEP607

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS:
1. ANSWER ONE QUESTION FROM EACH SECTION
2. IILUSTRATE YOUR ANSWERS WITH EXAMPLES AND CLEARLY DRAWN DIAGRAMS WHERE APPROPRIATE

ALLOCATION OF MARKS: EACH QUESTION CARRIES 50 MARKS

THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR

GEP607: GEOGRAPHIC INFORMATION SYSTEMS – DECEMBER 2019

SECTION A: ANSWER ONE QUESTION

QUESTION 1

The Kingdom of Eswatini is concerned with the continued over-reliance on the Republic of South Africa and the Republic of Mozambique for electrical energy source. Work is therefore underway to explore alternative sources of energy in the country. As an energy officer in the Ministry of Natural Resources and Energy (MNRE), under the Department of Energy, you have been tasked with identifying potential sites for nuclear power energy generation in the country. You have decided to identify potential sites using suitability analysis in GIS.

a) Fully outline how you would undertake this task using weighted site selection. Your discussion must include the datasets you would source, the selection criteria, and an outline of how you would systematically undertake the task. (40 marks)

b) What limitations and uncertainties would you need to highlight to the ministry for the identified potential sites? (10 marks)

(50 Marks)

QUESTION 2

a) Briefly discuss the impact of the internet and technology on GIS. (10 marks)

b) List five areas of GIS application, and for each, explain in not more than three sentences how it is applied. (10 marks)

c) Using examples and illustrations where appropriate, compare raster and vector GIS data models, fully discussing the advantages and disadvantages of each representation. (30 marks)

(50 Marks)

SECTION B: ANSWER ONLY ONE QUESTION

QUESTION 3

Using examples and illustrations, discuss optical and RADAR systems, their differences, as well as the advantages and disadvantages of each system.

(50 Marks)

QUESTION 4

a) Discuss the different types of resolutions in remote sensing. (20 marks)

b) Discuss how you would use time series data to map wild fires in Eswatini between the years 2010 and 2018. (20 marks)

c) Briefly discuss the two (2) key parts of the spectrum that are maximally reflected by green vegetation. (10 marks)

(50 Marks)