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SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN GIS AND REMOTE SENSING

GGI: 4113: APPLICATIONS OF GIS AND REMOTE SENSING

May   2020   TIME: 3 HOURS

INSTRUCTIONS: ANSWER QUESTION **ONE** AND **ANY OTHER THREE** QUESTIONS

Question One (30 Marks)

(a) Define the following terms as used in GIS and Remote Sensing applications
   (i)   Radiometric Distortions
   (ii)   Hierarchical Analytical Process   (6 marks)
(b) Briefly explain the procedure you would follow while carrying out digital image classification.   (8 marks)
(c) Briefly explain the criteria you would use in deciding on the remote sensing data to use for military application in contingency planning support.   (6 marks)
(d) Kenya has persistently suffered rice production shortfalls leading to importation of rice. Explain mentioning suitable data and methodology, how you would use Remote Sensing and GIS for rice crop yield prediction.   (10 marks)

Question Two (20 Marks)

As an expert in geospatial science and specializing in remote sensing, the County Government of Siaya has approached you seeking advice on how to model Yala swamp dry season inundation variation in response to river Yala basin changing environment. In your response, explain giving reasons the following:
(a) Remote sensing data suitable for this application.   (3 Marks)
(b) Radiometric and geometric corrections to be carried out.   (6 marks)
(c) Processing framework and methodology you would develop for this analysis   (7 marks)
(d) Other data that you could use for your analysis   (4Marks)

Question Three (20 Marks)

You have been approached by the ministry of Water as an expert in GIS and Remote Sensing to advice on the controversial Kimwarer Dam in Elgeyo Marakwet County.

(i) In your advice, outline the physical factors that would determine the feasibility of this dam. (7 marks)

(ii) Explain giving reasons the various satellite data you would recommend for identifying the physical factors you have identified in (a) above. (5 marks)

(iii) Explain in detail the methods you would propose for this assignment. (8 marks)

Question Four (20 Marks)

You have been approached by the County Government of Muranga to advice on the frequent occurrence of landslides in the County.

(a) In your advice to the County, outline the conditions favorable for the causation of landslides that can be identified using geospatial data. (7 marks)

(b) Explain giving reasons the various GIS data sets you would recommend for identifying the conditions you have identified in (a) above. (5 marks)

(c) Explain in detail the methods you would propose for this assignment. (8 marks)

Question Five (20 Marks)

(a) You have been approached by the International Centre for Insect Physiology and Ecology (ICIPE) to advice on mapping pastoralist movement patterns and risk zones of Rift Valley fever occurrence in Kenya. Explain the datasets and the methodology you would propose for this assignment. (10 marks)

(b) The County government of Nyeri has identified coffee production as an important driver of County development. Explain the data sets and their sources and the methodology that you would propose for coffee suitability analyses for identify areas that can be put under coffee production. (10 marks)

QUESTION SIX   (20 marks)

(c) Radar data is used for various applications. Using suitable examples outline the characteristics of data from radar sensors and state some specific applications areas where data from radar sensors could be utilized (8 marks)

(d) Distinguish land use from land cover and briefly explain the factors influencing land use/cover changes. (6 marks)

(e) Differentiate minimum distance to means from maximum likelihood classifier (6 marks)