SOUTH EASTERN KENYA UNIVERSITY

UNIVERSITY EXAMINATIONS 2014/2015

THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR BACHELOR OF SCIENCE IN HYDROLOGY

WRM 304: GEOGRAPHIC INFORMATION SYSTEM AND REMOTE SENSING

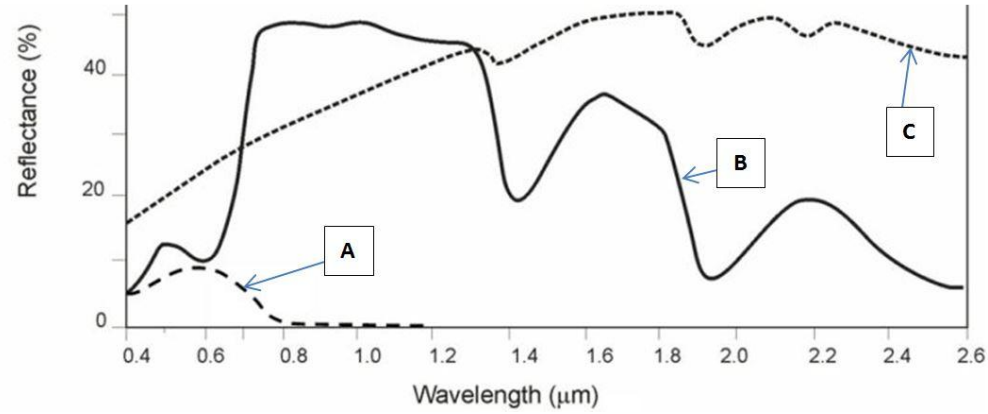
DATE: 20th APRIL 2015 **TIME: 4:00-6:00pm**

Instructions:

a) *Answer all the questions in section A (30 marks).*
b) *Answer any **two (2)** questions in Section B (40 marks).*
c) *Maximum marks for each question are as shown.*
d) *Illustrate your answers with carefully drawn sketches and diagrams where appropriate;*

Section A

1. (a) Name the four main components of a GIS. **(4 marks)**
   (b) Give an example of GIS application software **(1 mark)**
2. (a) Name three ways in which spatial data can directly be acquired **(3 marks)**
   (b) Name two map digitizing techniques **(2 marks)**
3. List five components of a remote sensing system **(5 marks)**
4. (a) List three ways in which vector model can be represented in a map giving an example for each case **(3 marks)**
   (b) Resolution of a digital map is determined by? **(1 mark)**
   (c) Given two maps of the same area, one with a total of 100 pixels and 500 pixels respectively, which of the two would best represent geographical features? **(1 mark)**
5. (a) List four remote sensing platforms **(2 marks)**
   (b)The figure below illustrates spectral signatures A, B and C for three types of land covers. Identify the three types of land covers respectively. **(3 marks)**



6. List five spatial analysis operations which can be performed by a GIS **(5 marks)**

Section B

7. (a) Compare and contrast vector and raster models **(10 marks)**
   (a) In five points, explain the application of GIS and remote sensing in water resources management and planning. **(10 marks)**
8. (a) Explain what is map projection and give three classes of map projections **(5 marks)**
   (b) Briefly describe five coordinate systems used to position objects in 2D or 3D space. **(15 marks)**

9. (a) Discuss four fundamental resolution properties in remote sensing **(12 marks)**
   (b) Differentiate between active and passive remote sensing giving two examples in each case **(8 marks)**