27/5/13

Roll No.										

B.E. / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2013
GEOINFORMATICS BRANCH

FOURTH SEMESTER – (REGULATIONS 2008)

GI 9252 DIGITAL IMAGE PROCESSING

Time: 3hrs **Max Marks: 100**

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. Differentiate various sensor characteristics of Landsat 5 and IRS 1C satellites.
2. What are the different type of satellite data products?
3. What is preprocessing? Why is it required?
4. Write short note on different types of geometric errors produced due to internal and external factors.
5. Using Sobel filter find out the brightness value BV5 of an image of size 3x3

   If BV1=5 BV2=1 BV3=3
   BV4=6 BV5=6 BV6=4
   BV7=8 BV8=3 BV9=6

6. Write short note on "spatial statistics".
7. What do you understand by the term spectral signature? Where is it used?
8. Classify the pixel a which has a brightness value of 40 in band 4 and 40 in band 5 using Minimum distance classifier for the following sample data.

Sl.no.	Class	Bands	Mean	Std.Dev.
1	Residential	Band 4	36.7	4.53
		Band 5	55.7	10.72
2	Commercial	Band 4	54.8	11.16
		Band 5	77.4	7.56

9. What do you understand by the term "Expert system".
10. Define Artificial Neural Network (ANN). List out different types of ANN

Part B (5 X 16 = 80)
Answer All Questions

11.i Explain in detail image sampling and quantization. **4**

ii Discuss in detail different initial display alternatives and Scientific visualization methods used to visualize the satellite images. **12**

12a.i Describe in detail with neat sketch how the geometric correction of satellite image is carried out. **10**

ii Using bilinear interpolation method, find out the brightness value of a pixel located at (2.5,2.2). The location of the sample pixels are (2,2); (3,2); (2,3); (3,3) and their pixel values are 8, 5, 10 and 20 respectively. **6**

(OR)

(PTO)

.12b.i What are the differences between absolute and relative radiometric corrections? 2

ii Explain in detail how the absolute radiometric correction of atmospheric attenuation of the satellite image is carried out. 14

13a. Explain the following in detail

i Fourier transform and it uses in digital image processing 8

ii Image fusion in different domain 8

(OR)

13b.i Explain the Principal Component Analysis(PCA) in detail and list out its use. 10

ii What are the methods used to assess the condition of a crop? Explain them in detail. How will you predict the yield of a crop? 6

14a. i Describe various methods of collecting training sites. 4

ii Describe in detail different supervised classification algorithms used to classify the satellite image. 12

(OR)

14b. i Differentiate between supervised and unsupervised classification methods. 3

ii Discuss in detail various unsupervised classifications methods used to classify the satellite image. 13

15a. i Describe in detail different methods used to detect and represent the boundary 6

ii Explain the ADALINE Neural Network in detail and Prove that 10

$$w^* = R^{-1} P$$

Where

w^* = Weight vector

R = Correlation matrix

P = Vector

(OR)

15b.i Describe briefly how the sub pixel classification is carried out. 6

ii What is fuzzy logic? Differentiate between fuzzy set and crisp set. Explain in detail how Fuzzy logic is used to classify the satellite image. 10