M.Sc. 2nd Semester Examination, 2011

REMOTE SENSING & GIS

PAPER—RSG-201 (Gr.A&B)

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

GROUP—A

(*DIP- Introduction, Preprocessing and Enhancement*)

[*Marks* : 20]

Answer any *two* questions

1. What are the non-systematic geometric errors encountered in digital remote sensing data? Describe the process of rectification citing a set of second degree polynomial equations. 5 + 5

2. Explain with suitable example how the principal components transformation help in better understanding of image. Describe the detailed process of the transformation. 10

3. (*a*) Describe briefly the edge detection method in an image. Why edge detection is necessary in image processing ?

(*b*) What is meant by "image mosaic" and "image fusion" ? 5 + 5

4. Write short notes on any *two* of the following : 5 + 5

(*i*) Image enhancement using histogram manipulation

(*ii*) Region growing and thresholding of satellite image

(*iii*) Spatial filtering of satellite image

(*iv*) Image fusion and image mosaicing.

GROUP—B

[*Marks* : 20]

Answer any *two* questions

1. (*a*) What are the general steps used to extract Land cover information from digital remote sensing data ?

   (*b*) What is the basic difference between fuzzy and hard logic of image classification ?

   (*c*) What is measurement vector ? 4 + 5 + 1

2. State the similarity and dissimilarity between image filtering and image enhancement. State the nature of Gaussian histogram. Explain the process of histogram equalization. Write about different types of convolution filters for interpretation of RS data. 1 + 2 + 3 + 4

3. What do you mean by preprocessing tasks of remote sensing images ? Briefly discuss about the various preprocessing tasks of the remote sensing images. 2 + 8

4. Write short notes on any *four* : $2\frac{1}{2} \times 4$

(*i*) Feature space plot

(*ii*) Display resolution and colour resolution of image processing system.

(*iii*) Minimum distance to main algorithm

(*iv*) Divergence matrix (spectral separability)

(*v*) Ellipsoid display (spectral separability)

(*vi*) Sources of error in digital classification.