2013

M.Sc.

2nd Semester Examination

REMOTE SENSING AND GIS

PAPER—RSG-201

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Use Separate answer book for each Group.

Group–A

(DIP – Introduction, Preprocessing and Enhancement)

[Marks : 20]

Answer any *two* questions. 2×10

1. What do you mean by Line Drop and Bit Error ? How these errors can be corrected ? Calculate 'Minimum-Maximum' contrast stretch for the following pixel values of an eight bit integer dataset : 2+3+5

4	56	111
17	8	157
43	98	21

2. What type of Polynomial Transform would you suggest for geometric correction of a rugged terrain and how many GCP's are needed for that order?

Why geometric corrections are essential for image processing?

Compare advantages and disadvantages of different methods of resampling. 2+3+5

3. Why Band Ratio is required for an image with undulating terrain?

What is Path Radiance and how does it affect image quality?

Convert the following DN values into radiances; where, Gain = 0.656863 w $cm^{-2}sr^{-1}\mu m^{-1}$ and offset = – 3.1999969 w $cm^{-2}sr^{-1}\mu m^{-1}$:

125	201	61
97	11	188
59	38	236

4. A near infrared band (LISS-III : B3) is divided by middle infrared band (LISS-III : B4). How will you classify output values much greater than 1 and output values smaller than 1 ? Explain with reasoning. 2+2+2+4

What effect will you expect when following mask is applied to an image ? Apply this mask on the image below and compute the central pixel value :

0	−1	0
−1	5	−1
0	−1	0

a) Mask

10	15	11
13	40	12
11	10	14

b) Image

Group–B

(Information Extraction)

[Marks : 20]

Answer any *two* questions. 2×10

1. (a) Define image classification and classification processes.

(b) What is supervised classification ?

(c) Write down steps of supervised classification procedures. 3+3+4

2. How accuracy of a classified image can be assessed? What are the importance of ground truthing? What do you mean by 'spectral signature'? 4+3+3

3. (a) What are basic differences between image enhancement and image classification?

(b) Suppose you want to classify a low contrast image, what effect do you expect on classification output if contrast stretching is performed before classification procedure?

(c) You are required to classify a multispectral image for water bodies. What are advantages and disadvantages of performing this classification on PC-1 image? 5+2+3

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

(a) Kappa Co-efficient ;

(b) Change Detection ;

(c) Image Space & Feature Space ;

(d) Parallelepiped classification ;

(e) Isodata classification ;

(f) Display Resolution ;

(g) Hardware Requirement for Image Processing.
