

2007

**REMOTE SENSING AND
GEOGRAPHIC INFORMATION SYSTEM****PAPER – V (MOD-13 & 14)***Full Marks : 100**Time : 4 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.

Write the answers of questions for each modules in separate books.

MODULE - 13 (Full Marks : 50)**Digital Image Processing****(Basics, Preprocessing and Image Enhancement)****Group-A**Answer any *two* questions.

2x 15

1. What are the data formats for storing multispectral **satellite** data ? What are the advantages of each data format ? Briefly describe the steps of RS image analysis.
5+4+6
2. What is principal component analysis ? What is its **importance** ? The correlation coefficient between two **bands is 0.95**, what does it mean ? What is a variance covariance matrix? How it is computed ?
5+2+3+5

(Turn Over)

3. **What is edge enhancement ? Why it is important in image processing ? Briefly describe the non-linear edge enhancement.** 5+2+8
4. **What is vegetation index and how it is -differ from NDVI ? Write down NDVI for TM & MSS. Explain Tasseled Cap Transformation.** 3+2+5+5

Group-B

Answer any two questions.

2X 10

5. **What is non systematic error ? Explain image to map rectification.** 3+7
6. **Compute the variance covariance matrix on the following data collected by satellite sensor.** 10

Pixel.	Band-1	Band-2	Band-3	Band-4
(1,1)	140	54	185	200
(1,2)	175	32	220'	2\$0
(1,3)	110	22	140	190
(1,4)	145	47	205	215
(1,5)	185	62	210	' 230

7. **State the approaches to remove atmospheric effects from remote sensor data. Explain path radiance & diffused sky radiance.** 6+2+2
8. **Write short notes on any two** 2x5
- (a) **Relative radiometric correction of atmospheric attenuation.**
- (b) **Effects of topographic slope & aspect on remote sensing data.**

- (c) Spatial convolution filtering.
 (d) Image to map registration.

MODULE - 14 (Full Marks : 50)

Digital Image Processing

Group -A

Answer any two questions.

2x 15

1. **Discuss** the 'seed pixel' approach **as an alternative to manual delineation of training areas in supervised classification**. What are the **common methods used in classification of mixed pixels** ? **Explain with example**.
5+10
2. **Narrate** the significance of change detection in Landuse Land cover study. Which of the **remote sensing sensor parameters and environmental variables should remain constant during multirate analysis of satellite images** ? **Differentiate between temporal image differencing and post classification comparison**.
3+7+5
3. **What are the advantages and disadvantages of unsupervised classification** ? **What do you mean by 'clustering' in unsupervised classification** ? **Discuss the Iterative Self Organizing Technique' with example**.
3+2+10
4. Schematically **illustrate** the steps involved in 'speckle **suppression**' and 'textural classification' of SAR images. Also describe the hardware and software configuration (as per your present laboratory set up) required for these **analysis**.
3+4+8

6. **What are the techniques used for hyperspectral image analysis? How has remote sensing replaced the laboratory test materials?** 6+4
6. **'Extensive interband correlation hinders multispectral image analysis'. What are the techniques used to reduce such redundancy?** 10
7. **Narrate the common methods of accuracy estimation in post classification analysis. Enumerate the evaluation procedure of error matrices.** 7+3
- S. **Write short notes on any two (not exceeding 100 words):** 2x5
- GPS & Ground Truthing.**
 - Colour space transformation (RGB to HIS).**
 - Hybrid classification (Supervised & Unsupervised).**
 - Limitation of Minimum distance to mean classifier.**