PG/IIS/RS & GIS/1201 & 1202/10

M.Sc. 2nd Semester Examination, 2010

REMOTE SENSING & GIS

(Digital Image Processing)

PAPER—V

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

RG-1201

[*Marks* : 20]

Answer any *two* questions

1. Why georeferencing of satellite image is needed? What is basic principles of georeferencing? What are the roles of datum and projection system in georeferencing? Does resampling in georeferencing effect the image interpretation? 2 + 5 + 2 + 1

2. (*a*) What is the difference between multidimensional image and multispectral image?

(*b*) Describe briefly three principal data formats for storing digital data collected by remote sensing satellites. 2 + 8

3. Compute the variance-covariance matrix on the following data collected by a satellite sensor: 10

Pixel	Band-1	Band-2	Band-3
(1, 1)	130	57	180
(1, 2)	165	35	215
(1, 3)	100	25	135
(1, 4)	135	50	200
(1, 5)	145	65	205

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

(*i*) Band combination

(*ii*) Image enhancement

(*iii*) Linear stretch

(*iv*) Density slicing.

[*Marks* : 20]

Answer any *two* questions

1. Narrate the 'Bayesian' supervised classification technique. Describe how the inclusion of variance-co-variance matrix enhances the chances of a better classification in supervised technique. 6 + 4

2. Critically examine the significance of fuzzy logic in digital classification. Narrate the common methods of accuracy estimation in post classification analysis. 5 + 5

3. What are the techniques used for hyperspectral image analysis? 'Extensive interband correlation hinders multispectral image analysis'. How we can reduce such redundancy? 4 + 6

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

   (*i*) Feature space plot

   (*ii*) Change detection

(*iii*) Colour space transformation (RGB ⇄ IHS)

(*iv*) Array processor

(*v*) Name the required hardware for a DIP system

(*vi*) Signature extension problem

(*vii*) Hard logic in digital classification.
