M.Sc. 1st Semester Examination, 2010

REMOTE SENSING AND GIS

PAPER—RSG-102 (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

(*Photogrammetry Basics*)

[*Marks*: 20]

Answer any *two* questions

1. (*a*) State the difference between black and white IR film and colour IR film.

   (*b*) State the relationship between film speed, film density and exposure latitude.

   (*c*) Discuss the nature of black and white film emulsion. 2 + 6 + 2

2. (*a*) What is primary colour ?

(*b*) How the false colour is processed using colour IR emulsion ?

(*c*) If a polarization filter is used instead of blue filter what will be the systematic impacts over the output. $2 + 5 + 3$

3. Explain different types of 3D photogrammetric orientation. Write the equation which express the collinearity condition. What are the two applications of collinearity equation ? What is photogrammetric workstation ? $4 + 2 + 3 + 1$

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

(*i*) Orientation in photogrammetry

(*ii*) Pseudoscopy

(*iii*) DEM

(*iv*) Film emulsion

(*v*) γ of characteristic curve

(*vi*) Additive and subtractive primary colour

(*vii*) Diapositives.

(*viii*) IMT (Independent Model Triangulation)

GROUP—B

[*Marks* : 20]

Answer any *two* questions

1. What is the relationship between relief displacement in vertical aerial photograph and (*i*) Flying height of the aircraft (*ii*) Radial distance from principal point and (*iii*) Actual height of the tower. A tower has been photographed two times over the same principal point with flying height difference of 100m. In the first photograph (P_1) $d = 2{\cdot}13$ mm and $r = 63{\cdot}43$ mm and in second photograph (P_2) $d = 1{\cdot}987$ mm. Considering both of the photographer are of the same scale, find out the height of the tower.

[d = displacement of the top of the tower from its base and r = radial distance of the top of the tower from principal point] 6 + 4

2. Define photogrammetry? What are the various requirements for stereoscopic vision? What is orthophotography? Explain with diagrams the theory of orthophotography using anaglyphic principle. 10

3. What is meant by image parallax and how does it contribute to topographical mapping? Explain with a neat diagram how the difference in elevation between two points can be measured from their parallax difference on stereo pairs. 4 + 6

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

   (*i*) Derivation of the scale of an aerial photograph

   (*ii*) Object height measurement from shadow length

   (*iii*) Parameters of flight planning

   (*iv*) Factors affecting ground coverage of an aerial photograph

   (*v*) Airphoto interpretation techniques

   (*vi*) Calculation of 'photobase' and 'isocentre'.
