M.Sc. 2nd Semester Examination, 2011

REMOTE SENSING & GIS

PAPER—RSG-203

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

Answer any *two* questions : 10×2

[*Marks* : 20]

1. What do you mean by co-ordinate ? What are two basic co-ordinate reference systems used to locate a point on two dimentional plane

and what are their conversion parameters ? Briefly discuss the process and use of affine transformation in GIS. 1 + 6 + 3

2. Describe the shape of the earth with the help of ellipsoid-geoid model. Differentiate between geocentric, geodetic and astronomical latitude. What is gooid undulation ? 5 + 4 + 1

3. Define great circle. What are the properties of a spherical triangle and how it is different from a plane triangle. Prove that the area of a spherical triangle is the product of squire of the radius of that sphere and the spherical excess of that triangle. 1 + 3 + 6

4. Write short notes on Everest spheroid and WGS-84, mentioning their geometric constants and parameters. Write down the mathematical relation between the components of ellipsoidal (ϕ, λ, h) and Cartesian (X, Y, Z) co-ordinate system used for co-ordinate transformation. $2\frac{1}{2} + 2\frac{1}{2} + 5$

GROUP – B

(GPS & Mobile Mapping)

Answer any *two* questions : 10×2

[*Marks* : 20]

1. (*a*) What is the nature of radio signals transmitted from a GPS satellite ? Explain the structure of GPS satellite signals.

(*b*) Define PPS and SPS. What is ephemeris data. $2 + 5 + 2 + 1$

2. (*a*) What is the difference between "selective availability" and "anti-spoofing" ?

(*b*) What is signal multipath ? How can we overcome signal multipath while calculating a positional value ?

(*c*) Explain GDOP, PDOP and HDOP. $2 + (1 + 1) + (3 \times 2)$

3. (*a*) Describe the condition of good GDOP ? What is mask angle ? Why it is important in GPS technology ?

(*b*) Define "Doppler effect" in satellite ranging.

(*c*) Describe the procedure of ranging using C/A code. What is the importance of pseudo-random code ? (2 + 1 + 1) + 2 +(2 + 2)

4. (*a*) What is the difference between absolute and relative positioning ?

(*b*) List the different methods used in GPS surveying.

(*c*) Mobile mapping. 2 + 3 + 5