# M.Sc. 1st Semester Examination, 2010

## REMOTE SENSING AND GIS

PAPER—RSG-103 (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

(*Basics and Physics of Remote Sensing, Platform and Sensors*)

[*Marks* : 20]

Answer any *two* questions

1. (*a*) Discuss very briefly about atmospheric scattering.

(*b*) What is imaging and non-imaging Remote Sensing System?

(*c*) Which component of the atmosphere produce absorption at (*i*) 1·4 μm (*ii*) 2·7 μm, and (*iii*) 6·3 μm. 4 + 3 + 3

2. (*a*) What is radiometric resolution? Define "signal-to-noise" ratio and its significance for determining radiometric resolution.

(*b*) (*i*) What is "dwell time" and its significance in remote sensing.

(*ii*) Compare very briefly about Whiskbroom and Pushbroom scanners. 5 + 5

3. (*a*) How atmosphere influences the transmission of EMR through it? What are its effects on RS? What is meant by atmospheric window?

(*b*) What are importances of microwave and thermal bands in RS? 5 + 5

4. Write short notes on any *two* of the following : 5 + 5

(*i*) Pushbroom and whiskbroom scanners

(*ii*) Active and passive remote

(*iii*) Visual interpretation keys for RS images.

## GROUP—B

[*Marks* : 20]

Answer any *two* questions

1. (*a*) What are the advantages and disadvantages of hyperspectral remote sensing ? Name a satellite and its characteristics used for hyperspectral remote sensing.

(*b*) Give a brief outline of processing hyperspectral RS images. 5 + 5

2. (*a*) What is meant by earth's albedo ? What is range of wavelength of FMR used in thermal imaging ? What is the type of sensor used for thermal imaging ?

(*b*) Briefly describe the parameters computed from thermal images. Why the time of imaging is important in thermal RS ? 5 + 5

3. With the help of neat diagram briefly describe the 'Range' and 'Azimuth' resolution of a SLR system. What is the nature of relief displacement in Radar image and why ? What is 'speckle' ? 6 + 3 + 1

4. Answer any *five* : 2 x 5

(*i*) Black body radiation

(*ii*) LIDAR application in measuring height catagories of vegetation

(*iii*) Synthetic Aperture Radar (SAR)

(*iv*) Radar signal polarization

(*v*) LIDAR application in water depth measurement

(*vi*) Hyperspectral sensing and surface mineralogy

(*vii*) Thermal scanners.