2008

M.Sc.

1st Semester Examination

REMOTE SENSING AND GIS

PAPER—III

Full Marks : 40

Time : 2 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.

Module—I (RG-1105)

(Foundation of Remote Sensing)

Answer any *two* questions. 20

1. (a) Define "signature" in the light of remote sensing.

   (b) What is spectral signature? Explain its importance in remote sensing.

   (c) Which component of the atmosphere produce absorption at

   (i) 1.4 μm, (ii) 2.7 μm and (iii) 6.3 μm.

   3+2+2+3

2. (a) Discuss about 'electronic', 'vibrational' and 'rotational' transition in the light of the EMR interaction with the matter.

(b) What are the two forms of selective scattering and how does selective scattering differ from non-selective scattering?

(c) What is a false colour image and how is it produced? 4+4+2

3. (a) What are the three forms of interaction when the electromagnetic energy strikes upon a surface?

(b) What is the wave length of EMR which has a frequency of 5×10^{10}Hz? What type of electromagnetic radiation has this wavelength?
given C = 3×10^{8} m/s

(c) Why is clear non-turbulent water blue/green in the visible part of the electromagnetic radiation spectrum and black in the near infrared? 3+4+3

4. Write short notes on any *two* : 2×5

(a) Keplar's three laws of planetary motion.

(b) Atmospheric windows.

(c) Passive & Active remote sensing.

(d) Blackbody radiation.

Module—II (RG-1106)

Answer any *two* questions. 10×2

5. (a) Write Wien's displacement law. Evaluate Wien's displacement law with respect to Stefan-Boltzman law.

(b) Differentiate between optical & thermal remote sensing.

(c) What is the difference between Kinetic temperature and radiant temperature.

(d) The temperature of a molten Lava is at 1100K, find out the wavelength at which maximum radiation will take place? 3+2+2+3

6. (a) Define Thermal Conductivity, Thermal Capacity and Thermal Inertia.

(b) The Kinetic temperature of some sugarcane leaves and certain marshy lands both measured to be 295K. Find the radiant temperatures of both the objects. (Emissivities of sugarcane leaves and marshy land are 0.98 & 0.95 respectively).

(c) Write the Kirchoff's law of radiation. What are the characteristics of black body radiation.

3+4+3

7. (a) Mention some distinct advantages and disadvantages of microwave domain vis-a-vis optical remote sensing.

   (b) Explain the fundamental differences between a Synthetic Aperture Radar (SAR) and a Real Aperture Radar (RAR). 5+5

8. Write short notes on any *five* : 2×5

   (a) RADAR.

   (b) LIDAR.

   (c) Hyperspectral Remote Sensing.

   (d) Geometric and Electrical Characteristics of SLR imagery.

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