2017

M.Sc.

2nd Semester Examination

REMOTE SENSING AND GIS

PAPER—RSG-202

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.

Use Separate answer book for each Group.

Group–A

(*GIS*)

[Marks : 20]

Answer any *two* questions. 2×10

1. (a) Discuss effects of atmosphere on thermal measurements.

(b) How at-nadir and off-nadir thermal measurements limits thermal image analysis ?

(c) What are the advantages of push-broom over whisk-broom system of thermal measurement ?

2. (a) Discuss the effect of topographic slope and aspect on land surface heating.

(b) Write briefly on the effect of vegetation over a thermal image.

(c) Predict the relative gray tones you would expect for a barren rocky surface and standing water at 4AM and 2PM. Give reasons. 4+4+2

3. Write down the parameters which control the ground resolution cell size of a SLR system and how they affect the Range and Azimuth resolution ? What is the nature of Relief displacement in Radar imagery and why ? 7+3

4. Describe how the geometrical and electrical properties of the target influence the Radar return. What is 'speckle' ? What do you mean by 'multiple Look' on 'non-coherent integration' for speckle supression ? How a narrow beamwidth can be achieved by synthesizing a virtual antenna length ? 3+3+4

Group–B

(*Data Storage*)

[Marks : 20]

Answer any *two* questions. 2×10

1. Briefly explain the process of endmember collection from hyperspectral image using suitable illustration. Why hyperspectral images are preferred for rocks and minerals identification ? 7+3

2. What do you mean by bad band and bad lines ? How they are removed from hyperspectral image ? Explain LiDAR data clouds.
Estimate the diameter of the instantaneous laser footprint when n = 850m AGL, scanning angle is 16° and beam divergenece = 0.9mrad. 2+3+2+3

3. Briefly explain the types of LIDAR returns with suitable illustration.
Mention the specifications of Hyperion sensor.
Estimate the horizontal and vertical accuracy of LIDAR data using following measurements.

Sl. No.	In situ measurements		LIDAR derived measurements		Sl. No.	In situ measurements	LIDAR derived measurements
	x	y	x	y		z	z
1	78.22	22.90	78.25	22.82	1	780	778
2	78.14	22.71	78.03	22.60	2	767	769
3	78.39	22.32	78.51	22.37	3	829	832

3+2+5

4. Explain the principle of LIDAR technology through proper illustration.

Outline the advantages and disadvantages of LIDAR measurements for ecosystem science applications.

Write in brief application of LIDAR in urban mapping.

4+3+3

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