2022

M.Sc.

2nd Semester Examination

REMOTE SENSING AND GIS

PAPER—RSG-202

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

RSG–202.1
THERMAL AND MICROWAVES REMOTE SENSING

Group—A

Answer any *two* questions.   2×2

1. Advantages of thermal push-broom over across-track thermal scanning.

(Turn Over)

2. Effects of atmosphere on thermal measurements.

3. What are the advantages of RADAR over normal MSS data?

4. What is the nature of relief distortion in RADAR imagery?

Group – B

Answer any *two* questions.   2×4

5. Discuss the effect of topographic slope and aspect on land surface heating.

6. How do you distinguish (with reasons) following land-cover objects from day-time and night-time thermal images?

(a) Water bodies vs. Rocks;

(b) Tree foliage vs. Grass and low-lying vegetation;

(c) Consolidated versus Unconsolidated Materials;

(d) Pavement materials versus Metal surgaces.

7. Discuss foreshortening, layover and shadow.

8. How Pulse length affects the plotting of signal return ? Why PL/2 is the minimum necessary distance to plot two objects separately ?   2+2

Group – C

Answer any *one* question.   1×8

9. (a) Elucidate the concept of thermal inertia and how apparent thermal inertia can be calculated from diurnal temperature (explain with illustrations).

(b) Of materials in the table below, which will show largest and smallest temperature fluctuations during a 24 hours *heating/cooling cycle*?

	Water	Sandy Soil	Basalt	Stainless Steel
Thermal Conductivity (K)	0.0014	0.0014	0.0050	0.030
Heat Capacity (c)	1.0	0.24	0.20	0.12
Density (ρ)	1.0	1.82	2.80	7.83

5+3

10. Describe the parameters that effect radar backscatter signals. Differentiate azimuthal and slant range resolution of SAR images. 3+5

RSG–202.2

HYPERSPECTRAL REMOTE SENSING AND LIDAR

Group – A

Answer any *two* questions. 2×2

1. Differentiate between DSM and DTM.

2. Which spectral ranges of LIDAR sensors are being used for topographic and bathymetric mapping?

3. Mention the specifications of HySi sensor.

4. What is endmember?

Group – B

Answer any *two* questions. 2×4

5. Briefly discuss on spectroscopy.

6. Write a brief note on PPI.

7. Measure across track swath width given scan angle = 15 degree, h = 800 m.

8. Write the process of identifying LIDAR Laser location.

Group – C

Answer any *one* question.   1×8

9. Write a brief note on the advantages and disadvantages of hyperspectral remote sensing. What is SAM ?   4+4

10. Which variables are required for processing LIDAR dataset ? Explain the post-processing of LIDAR multiple returns.   3+5

[Internal assessment – 10]

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