PG/IIS/RSG/205/25

M.Sc. 2nd Semester Examination, 2025

REMOTE SENSING AND GIS

(*Hyperspectral Remote Sensing and Lidar*)

PAPER – RSG-205

Full Marks : 25

Time : 1 hour

Answer **all** questions

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 from the following : 2×2

1. Which method is used for removing dark vertical stripes in the Hyperion datasets ?

2. How would you collect roi (region of interest) for Flat Field atmospheric correction ?

3. Which regions of EMR are used for topographic and bathymetric LIDAR survey ?

4. What are the components of LIDAR antenna attitude ?

GROUP–B

Answer any two questions from the following : 4×2

5. Mention the water retrieval regions and types of aerosol models used as input in FLAASH atmospheric correction model.

6. What are the limitations of hyperspectral remote sensing ? What is SNR ?

7. Estimate diameter of the instantaneous laser footprint (Fp_{inst}) on the ground if $h = 900$ m AGL, $\theta_{inst} = 10^{\circ}$, and $\gamma = 1.1$ mrad.

(*Continued*)

8. Explain the basic principles and components of the LIDAR system with a neat sketch.

GROUP – C

Answer any **one** question from the following : 8×1

9. Explain the significance of LIDAR multiple returns in 3D mapping using a suitable illustration. How are DTM and DSM files generated from LIDAR mass points ? $5 + 3$

10. Explain the procedure of endmember collection from hyperspectral imagery. What are the applications of hyperspectral remote sensing ? $5 + 3$

[Internal Assessment — 5 Marks]