

M.Sc. 2nd Semester Examination, 2023

REMOTE SENSING AND GIS

(Advanced Remote Sensing)

PAPER – RSG-202.1 & 202.2 (New Syllabus)

Full Marks : 40

Time : 2 hours

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

PAPER – RSG 202.1

(Thermal and Microwave Remote Sensing)

[Marks : 20]

GROUP – A

Answer any two questions : 2 × 2

1. Define spatial resolution.
2. Define Scattering.
3. What is the acronym for 'RADAR' ?
4. What is apparent temperature and kinetic temperature of an object ?

GROUP – B

Answer any two questions : 4 × 2

5. Calculate the effective temperature of Sun. Given that the wavelength of maximum energy in the solar spectrum is 475×10^{-9} m.
6. Write a short note on 'Blackbody'.
7. Compare between imaging and non-imaging sensor.
8. What is microwave remote sensing and write the advantages of microwave remote sensing ?

GROUP – C

Answer any one question : 8 × 1

9. Explain atmospheric windows in thermal infrared region with suitable illustration. Shortly describe Stefan-Boltzmann law. 4 + 4
10. Briefly write down the application of Microwave remote sensing. 8

PAPER – RSG 202.2

(*Hyperspectral Remote Sensing and LIDAR*)

[Marks : 20]

GROUP – A

Answer any two questions : 2 × 2

11. Which bands of hyperspectral image are considered for water retrieval in FLAASH model ?
12. Which regions of EMR are used for topographic and bathymetric LIDAR survey ?

13. What is pulse repetition frequency ?
14. How does orientation of LIDAR Antenna measured ?

GROUP – B

Answer any **two** questions : 4 × 2

15. How is SNR related with eigenvalue and eigen number ?
16. Write a short note on the advantages of hyperspectral remote sensing over multispectral remote sensing.
17. Briefly mention the sensor specification of Hyperion dataset.
18. Estimate diameter of the instantaneous laser footprint (Fp_{inst}) on the ground if $h = 850$ m AGL, $\theta_{inst} = 12^\circ$, and $\gamma = 1.1$ mrad.

GROUP – C

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

19. Briefly explain the process of endmember collection from hyperspectral image. 8
20. What are the types of LIDAR returns ? With a suitable illustration, explain the importance of LIDAR multiple returns in 3D mapping. 3 + 5
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