

M.Sc. 1st Semester Examination, 2023

REMOTE SENSING AND GIS

(Fundamentals of Remote Sensing)

PAPER – RSG-101

Full Marks : 50

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-101.1

(Fundamental and Physics of Remote Sensing)

GROUP—A

Answer any two questions : 2 × 2

1. Write a short note on advantages of Remote Sensing.
2. What do you mean by wavelength and frequency?
3. Define blackbody.
4. Write about the types of scattering.

GROUP—B

Answer any two questions : 4×2

5. Why does clear non-turbulent water appear blue/green in the visible part of the spectrum and black in the near infrared?
6. Write concisely about the EMR spectrum and its properties.
7. What are the implications of the “Stefan Boltzman law” in Remote Sensing?

(3)

8. Define absorptions. Which components of the atmosphere produce absorption at (1) 1.4 μm and (2) 6.3 μm ?

GROUP - C

Answer any **one** question : 8×1

9. Explain energy interaction with earth surface features. Sketch the spectral reflectance of vegetation, soil and water.
10. What are the considerations for an ideal remote sensing system ?

PAPER - RSG-101.2

(*Platforms and Sensors*)

GROUP - A

Answer any **two** questions : 2×2

1. How do hyperspectral sensors differ from multispectral sensors in terms of spectral information ?

2. What role does spectral and radiometric resolutions play in satellite sensor capabilities ?
3. Explain Escape Velocity.
4. Write about active and passive sensor.

GROUP-B

Answer any two questions : 4×2

5. Describe polar orbiting satellite and write their major characteristics.
6. To prove that the centripetal acceleration (a_c) is equal to the square of the velocity (v) divided by the radius of curvature (r).
7. Describe various factors affecting microwave backscatters upon interaction with the ground surface.

8. Explain the concept of hyperspectral remote sensing and the characteristics of hyperspectral sensors on satellites. Discuss how hyperspectral sensors capture a wide range of spectral bands and their applications in precision agriculture and mineral exploration.

GROUP – C

Answer any **one** question : 8 × 1

9. State Kepler's law of Harmonies. Prove mathematical expression for the same.
10. What is Synthetic Aperture Radar (SAR)? How does SAR enhance the resolution of microwave remote sensing?

[Internal Assessment – 10 Marks]
