PG/IS/RSG-101/19

M.Sc. 1st Semester Examination, 2019

REMOTE SENSING AND GIS

(Fundamentals and Physics of Remote Sensing/ Platforms and Sensors)

PAPER – RSG-101.1+ 101.2

Full Marks : 40

Time : 2 hours

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

Write the answers to questions of each Paper in separate books

RSG-101.1

(Fundamentals and Physics of Remote Sensing)

[*Marks* : 20]

1. Answer any *two* questions : 2×2

   (*a*) What is spectral reflectivity curve ?

   (*b*) What do you mean by standard false color composite ?

   (*c*) Write any two characteristics of Remote Sensing.

   (*d*) What do you mean by EMR ?

2. Answer any *two* questions : 4×2

   (*a*) What are the differences between spectral and spatial resolution ?

   (*b*) Distinguish between kinetic temperature and radiant temperature.

   (*c*) What do you mean by wavelength-frequency-energy relationship of EMR ?

   (*d*) Write short notes on :

      (*i*) Atmospheric Window

      (*ii*) Advantages of Remote Sensing.

3. Answer any *one* question : 8×1

(*a*) What are the implications of the "Stefan-Boltzman" and "Wiens's" Displacement law in Remote Sensing ? What is "black body" radiation ? Define "signature" in the light of Remote Sensing. $4 + 2 + 2$

(*b*) Briefly discuss the different energy interaction processes in the atmosphere. 8

RSG-101.2

(*Platforms and Sensors*)

[*Marks* : 20]

4. Answer any *two* questions : 2×2

(*a*) What are Sun-synchronous, Geo-synchronous and Geostationary orbits ?

(*b*) Differentiate Whiskbroom and Pushbroom Sensors.

(*c*) Define Escape Velocity.

(*d*) What are Pseudocolor, Density Sliced images and Choropleth Map. ?

5. Answer any *two* questions : 4 × 2

(*a*) How Hyperspectral images differs from Multispectral image ?

(*b*) What factors are responsible for microwave backscattered signals upon interaction with ground ?

(*c*) What is LIDAR ? Describe its advantages and disadvantages.

(*d*) The period of the moon is approximately 27·2 days (2.35×10^6 s). Determine the radius of the moon's orbit and the orbital speed of the moon. Given, $M_{earth} = 5.98 \times 10^{24}$ kg.

6. Answer any *one* question : 8 × 1

(*a*) Define with examples-spectral, spatial, radiometric and temporal resolutions.

(*b*) A satellite wishes to orbit the earth at a height of 100 km above the surface of the earth. Determine the speed, acceleration and orbital period of the satellite.
(Given : $M_{earth} = 5.98 \times 10^{24}$ kg,
$R_{earth} = 6.37 \times 10^{6}$ m).