SABARAGAMUWA UNIVERSITY OF SRI LANKA

FACULTY OF GEOMATICS

B.Sc. HONOURS IN SURVEYING SCIENCES DEGREE PROGRAMME

YEAR II SEMESTER II EXAMINATION – MAY, 2022

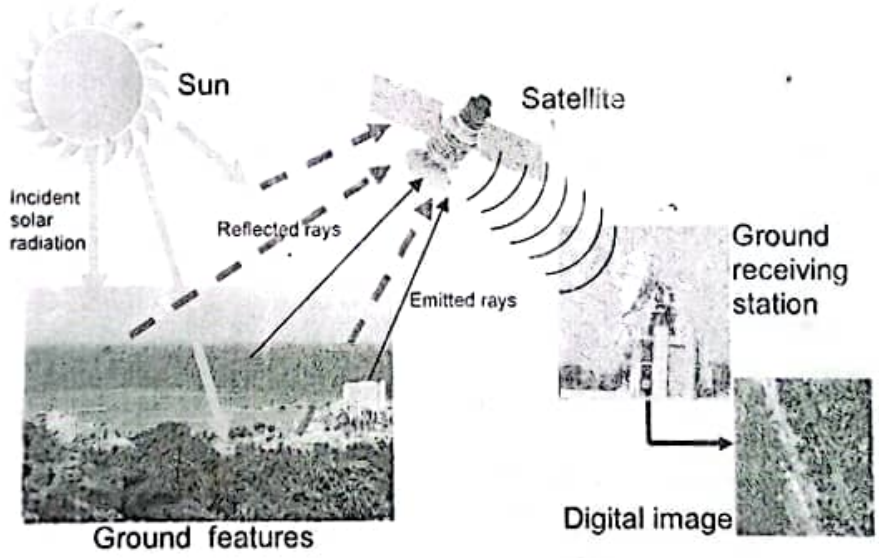
**OPTICAL REMOTE SENSING - FC 22351** **032**

Time allowed: **TWO (2) hours**

**Answer all questions.**

1. a. Explain the followings with a clear diagram
   - i. Pixel
   - ii. FOV
   - iii. IFOV
   - iv. Spatial resolution
   - v. Swath (12 Marks)

   b. The following figure shows the operational procedure of remote sensing. Describe in detail, how a digital satellite image is formed. (08 Marks)




2 a. Write short answers to the followings.
   - i. List out five (05) active missions (satellite systems) used optical sensors for earth observation? (03 Marks)
   - ii. What is the illumination source in active remote sensing? (01 Mark)
   - iii. Reflection depends on the characteristics of surfaces. What type of reflection occurs at a smooth surface? (01 Mark)
   - iv. List colours available in the visible range? (04 Marks)
   - v. Write down the sensors which are used for data collection by a human. (04 Marks)

2. b. Write short notes on the followings.

i. Spectral reflectance curves (05 Marks)
ii. Image file formats (05 Marks)
iii. Scattering (05 Marks)
iv. Scanning methods (05 Marks)
v. Geostationary orbit satellites (05 Marks)

3. a. i. Explain briefly the image interpretations. (05 Marks)

ii. What do the followings abbreviations related to the remote sensing, stand for?

ERDAS, LUT, EMR, NASA, SONAR, DARA, IRS, ISPRS, NRSA, IR (05 Marks)

iii. What are the properties of data storage devices? (02 Marks)

iv. Explain the radiometric resolution. (02 Marks)

v. An Environmental organization needs to identify the changes inside a forest. If they recruit you as a remote sensing analyst, how do you complete the task? (05 Marks)

b. i. What are the reasons for having radiometric errors in the satellite images? (02 Marks)

ii. List out the radiometric distortions. (05 Marks)

iii. Why is it necessary to perform geometric corrections for the satellite images? (02 Marks)

iv. A subset of a satellite images is given below. After applying the geometric corrections, two resampling methods are applied. In the output driven resampling, the position of a pixel (P) in the output image has to be found out at the position (3.2, 4.7) in the input image.

| Line numbers | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 25 | 17 | 47 | 22 | 65 | 14 | 88 |
| 6 | 15 | 25 | 14 | 25 | 85 | 17 | 67 |
| 5 | 12 | 63 | 36 | 32 | 25 | 18 | 27 |
| 4 | 13 | 66 | 22 | 34 | 38 | 24 | 47 |
| 3 | 14 | 22 | 84 | 39 | 35 | 54 | 18 |
| 2 | 22 | 31 | 57 | 22 | 25 | 84 | 82 |
| 1 | 65 | 54 | 24 | 32 | 21 | 23 | 28 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Column numbers

Calculate the DN value of pixel (P) for the output image by using two resampling methods. (10 Marks)

v. What are the problems you faced when you are applying geometric corrections with the help of ERDAS software? (02 Marks)