



**FIJI NATIONAL UNIVERSITY**  
**College of Agriculture, Fisheries & Forestry**  
**School of Agricultural Sciences and Forestry**  
**Department of Soil Science & Agril. Engineering**

**FINAL EXAMINATION: 2018**

**Bachelor of Science in Forestry III<sup>rd</sup> year: Trimester II<sup>nd</sup>**

**REMOTE SENSING AND ITS APPLICATION IN AGRICULTURE: AGR 701**

**Total marks: 100**

**Time allowed: 3 Hours and 10 min. reading time.**

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**INSTRUCTIONS:**

This paper consists of four (4) pages. Please check to see that your paper is complete.

**Answer all questions in the answer booklet.**

- Number your answers correctly in the provided answer booklet.
- Write your student ID number on all pages that you use including any additional sheet paper.
- Printed or written study materials are not allowed into the examination hall.
- Mark values appear at the end of each question or part thereof.

**“MOBILE PHONES ARE STRICTLY NOT ALLOWED”**

<b>SECTION NO.</b>	<b>TYPE</b>	<b>TOTAL MARKS</b>
I	MULTIPLE CHOICE	15
II	FILL & TRUE FALSE	15
III	ABBREVIATIONS	10
IV	LONG ANSWER	60
<b>TOTAL MARKS</b>		<b>100</b>

**Part I: Choose the right answer**

**10 x 1.5 = Total 15 marks**

1. Application of white colour on rooftop will result in?
  - a. Increase in reflectance
  - b. Decrease in reflectance
  - c. No effect in reflectance
  - d. None
2. Which of the following resolution best describes “the data has been recorded on yearly basis”?
  - a. Spectral
  - b. Temporal
  - c. Radiometric
  - d. None of the above
3. Which of the following spectral rays is used for vegetation properties?
  - a. Visible
  - b. Ultraviolet
  - c. Near Infrared
  - d. None of the above
4. The smallest discrete element which make up a raster image is referred as
  - a. Digital number
  - b. Pixel
  - c. Noise
  - d. Point
5. A raster module in the Arc GIS package is known as?
  - a. Pixel
  - b. Legend
  - c. Grid
  - d. None of the above
6. Which of the radiation is used in active remote sensing?
  - a. Sun
  - b. Artificial
  - c. Vapour
  - d. All of the above
7. The part of the drawn map explaining the meaning of symbols used to code the depicted geographical elements is known as?
  - a. Layer
  - b. Label
  - c. Legend
  - d. None
8. If the spatial resolution is larger, what would be the resolving power of the sensor?
  - a. Greater
  - b. Smaller
  - c. Same
  - d. None

9. Which one of the following resolution describes, the capability of identifying nearly kept two objects?
- |                |                      |
|----------------|----------------------|
| a. Spectral    | b. Temporal          |
| c. Radiometric | d. None of the above |
10. A Satellite images showing white colour indicates?
- |                |            |
|----------------|------------|
| a. Sand        | b. Ice cap |
| c. Saline soil | d. All     |

**Part II:**

**10 x 1.5 = Total 15 marks**

**A) Fill in the blank**

- Smallest change in the intensity level can be detected by the sensing system in ..... Resolution.
- Geosynchronous orbit is ..... km above the earth surface at the equator.
- NASA's Landsat satellite programme was initiated by .....
- The basic unit of energy for an electromagnetic wave is called a .....
- A map scale of 1: 1000000 is ..... scale map in comparison to a map scale of 1: 10000.

**B) State 'True' or 'False'**

- Microwaves radar has the ability to penetrate fog and rain.
- Most of the microwave sensors are passive sensors.
- SPOT satellite remote sensing programme was launched by Spain?
- Image depends on the wavelength response of the sensing instrument and the emission of the target.
- In remote sensing, energy source is not required to study the target of interest.

**Part III: Write the full form of given abbreviations**

**8 x 1.25 = Total 10 marks**

- |          |             |
|----------|-------------|
| 1. MIR   | 5. ETM Plus |
| 2. SPOT  | 6. LIDAR    |
| 3. NASA  | 7. NOAA     |
| 4. AVHRR | 8. FLIR     |

**Part IV: Write the answer for given questions**

**ATTEMPT ANY FOUR (4)**

**4 x 15 = Total 60 marks**

1. What is GIS? Demonstrate the scope of GIS in Forestry Science. Analyse and describe the components of GIS with appropriate diagram. List down the tasks that can be completed using GIS technologies?
2. Define remote sensing? What do you understand with geo-referencing of satellite data? Describe the classification of remote sensing based on the source of energy or radiation. Elaborate the frequency ranges of Electromagnetic Spectrum.
3. Demonstrate the neatly labeled sketch of the Remote Sensing Process Components. Describe the acoustic / near acoustic remote sensing and microwave remote sensing.
4. Demonstrate the neat sketch of Schematic of the components of an airborne LIDAR system. How an airborne LIDAR system works? Analyse and describe the advantages of LIDAR over aerial photography?
5. Provide the application of Remote Sensing in given areas.
  1. Meteorology
  2. Oil and mineral exploration
  3. Planning and applications
  4. Forest
  5. Hydrology.
  6. Disaster warning and assessment

**THE END**