



**FIJI NATIONAL UNIVERSITY**  
COLLEGE OF AGRICULTURE, FISHERIES AND FORESTRY  
SCHOOL OF AGRICULTURAL SCIENCES & FORESTRY  
Department of Soil Science & Bio Systems Engineering  
B.Sc Forestry III<sup>rd</sup> year: Trimester II<sup>nd</sup>, 2019

Remote Sensing and Its Application in Agriculture: AGR 701

**Writing Time: 3:00 hours**

Reading Time: extra 10 minutes allowed at the beginning of the exam

**Total Marks: 100**

**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.
- Calculators are permitted.

**"MOBILE PHONES ARE STRICTLY NOT ALLOWED"**

SECTION NO.	TYPE	TOTAL MARKS
I	<b>SHORT ANSWER</b>  a. Multiple choice : 10  b. Abbreviation : 20  c. Define/explain : 10	<b>40</b>
II	<b>ESSAY</b>	<b>60</b>
<b>TOTAL MARKS</b>		<b>100</b>

## SECTION I: SHORT ANSWER

### Part A: Multiple choice

*10 x 1.0 = 10 marks*

1. When microwaves strike a surface, the proportion of energy scattered back to the sensor depends on?
  - a. Land cover
  - b. Dielectric constant
  - c. Both (a) and (b)
  - d. None
2. An increase in farm yard manure (FYM) content in the field will result in rapid?
  - a. Increase in reflectance
  - b. Decrease in reflectance
  - c. No effect in reflectance
  - d. None
3. GIS function in survey is to?
  - a. Mapping
  - b. Data base
  - c. Both (a) and (b)
  - d. None
4. Satellite image showing red colour indicates the area under?
  - a. Forest
  - b. Ice cap
  - c. Ocean
  - d. None
5. Remote sensing is acquiring knowledge from a distant place by what actual touch with object?
  - a. With
  - b. Without
  - c. Both (a) and (b)
  - d. None of the above
6. If spatial resolution is larger, what will be the resolving power of the sensor?
  - a. Greater
  - b. Smaller
  - c. Same
  - d. None
7. Remote sensing satellites is known as?
  - a. Polar satellite
  - b. Sun-synchronous satellite
  - c. Both (a) and (b)
  - d. None
8. Which of the following spectral rays is used for vegetation properties?
  - a. Gamma rays
  - b. Ultraviolet
  - c. Near Infrared
  - d. None of the above
9. Which of the following resolution best describe "the data acquisition was done on monthly basis"?
  - a. Spatial
  - b. Temporal
  - c. Radiometric
  - d. Spectral
10. An important advantage using radar in remote sensing is?
  - a. Can penetrate thick clouds & moisture
  - b. Can penetrate earth crust
  - c. Both (a) and (b)
  - d. None

**Part B: Explain the given abbreviations**

*10 x 2.0 = 20 marks*

1. AVHRR
2. DEM
3. EMS
4. ETM+
5. IRS
6. GOES
7. RADAR
8. MIR
9. NOAA
10. TMS

**Part C: Define or explain**

**10 marks**

1. What is GIS? *2 marks*
2. What do you understand with Lower Earth Orbit? *2 marks*
3. List down the type of remote sensing based on energy source. *3 marks*
4. What do you understand with geo-referencing? *3 marks*

## **SECTION II: ESSAY**

### **Attempt all questions**

**15x 4.0 = 60 marks**

1. Draw a neatly labelled sketch of Geographic Information System Components and discuss any two of them. Enlist the steps of opening an existing “exploring\_the\_world” map file. What type of questions could be answered using “Query and Analysis” feature in GIS.

[5+5+5 = 15 marks]

2. Demonstrate the process components of remote sensing with appropriate diagramme. Analyse the visual, microwave and airborne remote sensing in your own views.

[6+3+3+3 = 15 marks]

3. What do you understand by LiDAR? Explain the major components of a LiDAR system (any two). What are the application of LiDAR in Forestry.

[6+2+2+5 = 15 marks]

4. Provide the list of the types of remote sensing resolutions and explain any two with appropriate diagram (if any). Apply your knowledge and explain the application of remote sensing in glaciology, oil and mineral exploration and climate.

[4+ 2+2 + 2+2+3 = 15 marks]

The end