# Remote Sensing 2011 Exam

<u>**Instructions**</u>

- ✓ **Make sure to take as much time as needed to take the exam but be sure to pace yourself.**
- ✓ **Don't use the internet or outside resources unless absolutely necessary this test is for your benefit.**
- ✓ **If you're unsure or are misunderstanding the question please email and I will rephrase the question in a manner that is suitable for you.**
- ✓ **The exam consists of 40 questions which are Fill in blank, Multiple Choice, and Short answer questions**
- ✓ **If you're unable to see any of the images you may enlarge it in the Microsoft word or search for the image online as sometimes it may be hard to see.**
- ✓ **When you have completed the exam please send me your final answers via email and I will grade the test accordingly and respond as soon as possible via email.**
- ✓ **Be sure to fill in all the questions even if you don't know the answer it cannot hurt to try. There will be partial credit on this exam.**
- ✓ **You may print out and complete the exam**
- ✓ **Try your best on the exam and Good Luck ☺**

1. **Let's start off with pictures ☺ Have fun! Fill in the blanks of Figure 1**

**Figure 1**
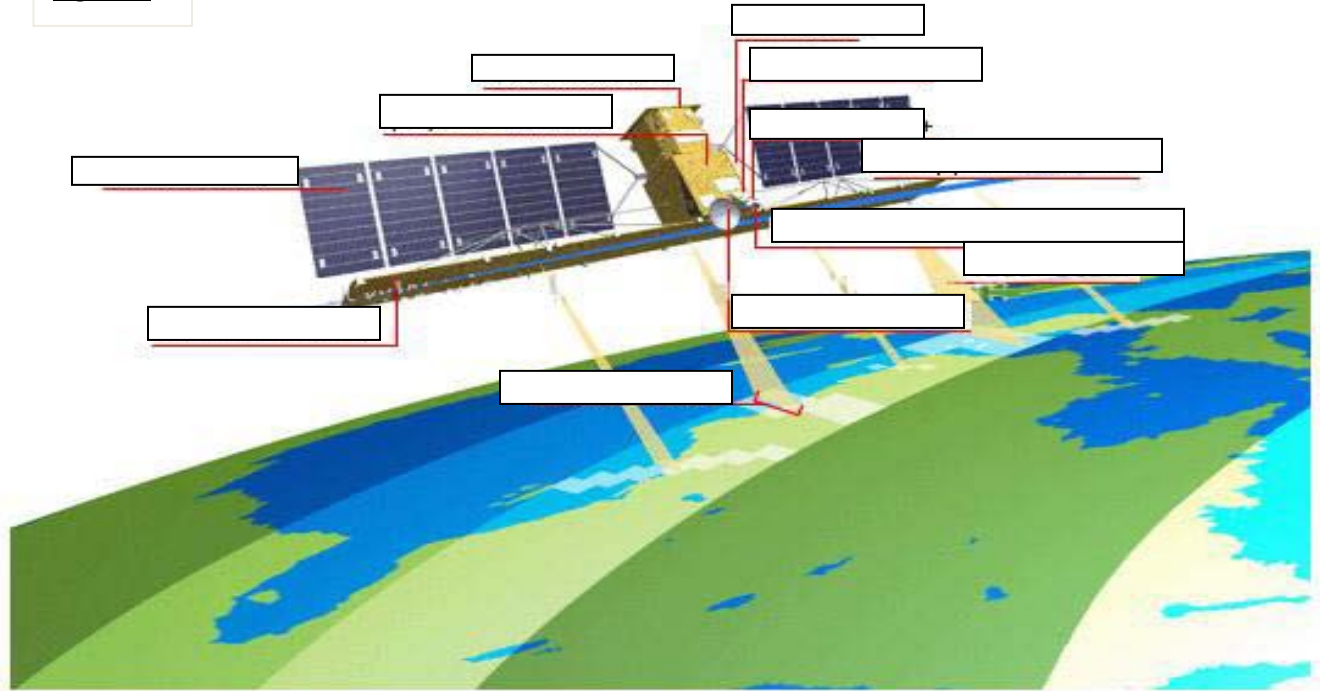
2. **In figure 2 point out where the following are located Gamma Ray, Infrared, Microwave, Radio, Ultraviolet, Visible, X-ray. What visible color has the longest waveband, and which has the shortest waveband?**
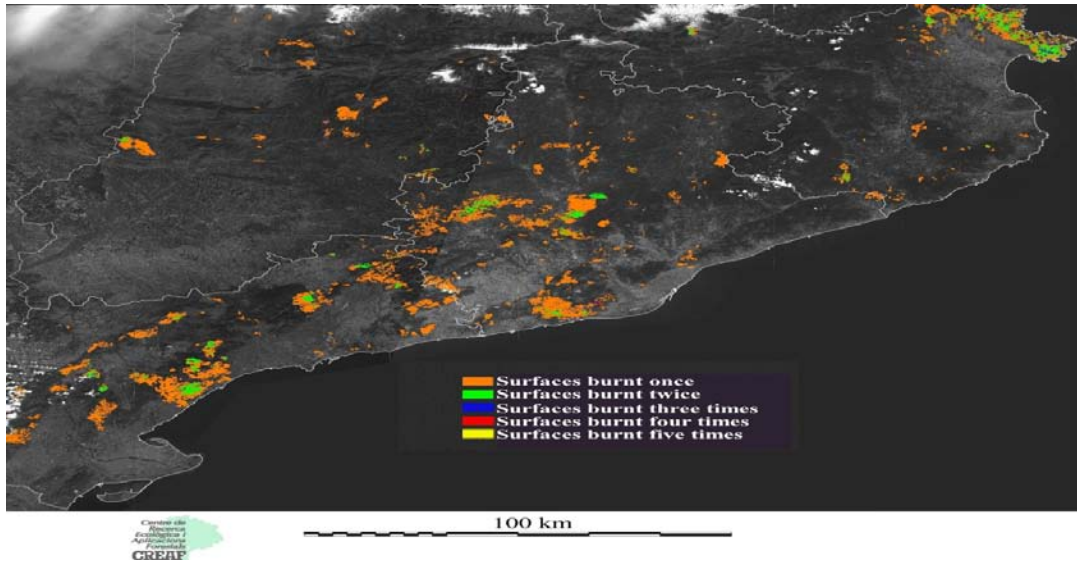
**Figure 2: Electromagnetic Spectrum: Wavelength (meters)**

| $10^3$ | $10^{-2}$ | $10^{-5}$ | $10^{-6}$ | $10^{-8}$ | $10^{-10}$ | $10^{-12}$ |
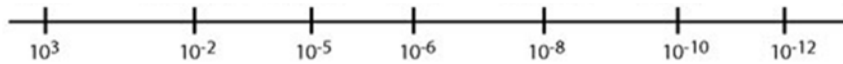
Shortest waveband _____

Longest waveband _____

3. **Using GIS methods, scientists/researchers can create maps that can assist in determining areas Of interest for management decision. Using the picture, determine areas where forestry Management teams may wish to focus their energy to prevent future fires (You may indicate on The map by circling). Why did you choose these areas?**

Surfaces burnt once
Surfaces burnt twice
Surfaces burnt three times
Surfaces burnt four times
Surfaces burnt five times

100 km

**Explain here why you chose these areas**

_____

_____

**Calculate the following**

4.    **Calculate the total area where reflectance is greater than 80% from Table 2. You do not need to use complete sentences for this question.**

Table 2: Reflectance values (%) of a LandSat TM image band 3.

| 79 | 92 | 93 | 78 | 72 |
|----|----|----|----|----|
| 82 | 87 | 62 | 67 | 63 |
| 80 | 53 | 63 | 55 | 43 |
| 13 | 16 | 37 | 69 | 38 |

**Total area of reflectance:**

<u>Vocabulary Time!!!!</u> ☺ <u>Hope you enjoy</u>

5.remote sensing-

6. electromagnetic spectrum-

7.electromagnetic energy-

8.frequency-

9.wavelength-

10.amplitude-

11.velocity-

12. transmission-

13. absorption-

14. emission-

15. incident radiation-

**Picture Multiple Choice- Pick the appropriate choice to go along with the picture provided. (2 pts each)**

    16.  Mt  St. Helens



**Question:  What is that blue  area in the picture**

    a.   A cloud

    b.   Snow on a mountain peak

    c.   Pond with covered ice

    d.   Salt flats

    e.   a crater

## 17. Yellowstone


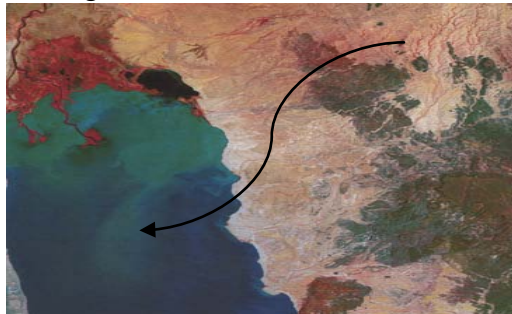
Question: What are the white patches in the circle?

     a.   Rain clouds

     b.   Snow on  the top of Sharon Lam's head

     c.   Smoke from a volcanic eruption

     d.    Forest fire

     e.   dust particles in Satellite image lens

## 17. Kenya

Question:  What is the big blue blob on the lower left side?



     a.   a gulf

     b.   A river

     c.   Kool-aid that Sharon Lam spilled

     d.   Ocean

     e.   A lake

18. Caspian Sea



Question: What is the blue – black at the bottom represent?

    a.   The Lost city of Atlantis

    b.   A pond

    c.   A large body of water

    d.   Melted polar ice caps

    e.   A great canyon

19. Kansas



Question: What is the red in the image above?

    a.   Forests

    b.   Red dust

    c.   Water

    d.   Red sand

    e.   Crops

**Fill in the blanks Have fun** ☺

21. When light is_____it is bounced around in particles.

22. When light is _____ it mirrors an object or item.

23. When light disperses or spreads out it is _____.

24. When an aerial image is taken of a geographic location it is called_____.

25. Other types of active collection include plasmas in the _____.

26. Seismograms taken at different locations can locate and measure _____ (after they

occur) by comparing the relative intensity and accurate timing.

**Short Answer- For the following respond in complete sentences**
**27. What does RADAR stand for?**

_____

**28. Do forest fires have only negative effects?  Explain.**

_____
_____

**29. Why are forest fires becoming a larger problem in most areas of the world?**

_____
_____
_____

**30. Deforestation occurs in many countries around the world at different times therefore it is difficult to detect the ongoing damage. Which of the following remote sensing instruments would be best suited to monitor the deforestation? Choose one of these instruments (Thermal infrared,Microwave,Radar,Sona, and Color infrared)**

_____
_____

**31.  Using the latitude and longitude system (degrees, minutes, seconds), 40 minutes is equal to what?**

_____
_____
_____
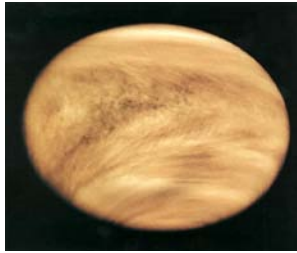
**32. What types of remote sensing would be most useful in obtaining an accurate terrain model of Venus (image above)? Choose one from the following(radar,GPS,sonar,Landsat, and thermal infrared)**

_____

_____

_____

**33. What is a GIS? And how does it work?**

_____

_____

_____

_____

**34.  In the 19<sup>th</sup> century, how were pigeons used in an earlier attempt of remote sensing?**

_____

_____

_____

_____

**35. Who came up with the idea of Camera Obscura in their notebook? Choose one of the following people ( Galileo Galilei,Thomas Edison, Leonardo Da Vinci, Isaac Newton, Rene Descartes)**

_____

_____

**36. What is the primary difference between a GIS and a computer-generated map?**

_____

_____

_____

**37. What name represents the satellite that uses the natural radiation emitted from an object?**

_____

_____

_____

**38.  How does a Landsat satellite differentiate between objects on Earth's surface?**

_____

_____



**39. How does the satellite Topex/Poseidon(Image above) map ocean features?**

_____

_____

_____

**40. Explain how remote sensing data can be used to monitor human activity. Provide at least three examples. (2 pts)**

_____

_____

_____

**Standard Multiple Choice Questions**

**41. Stereographic pairs of _____ have often been used to make topographic maps by imagery and terrain analysts in traffic and highway departments for potential routes.**

    a.  **Aerial Photography**
    b.  **Photography**
    c.  **Polaroid**
    d.  **Cloudscape Photography**

**42. Radiometers and _____ are the most common instrument in use, collecting reflected and emitted radiation in a wide range of frequencies.**

    a.       **Infrared**
    b.       **Photometer**
    c.       **Absorption Spectroscopy**
    d.       **Spectroscopy**
    e.       **Radios**

**43.** _____ is an example of active remote sensing where the time delay between emission and return is measured, establishing the location, height, speed and direction of an object.

a. Ultra high frequency
b. X-band
c. Radar
d. Weather Radar
e. A ruler

**44.** To compare, overlay, or cross-analyze two maps in a GIS_____

a. Both maps must be in digital form
b. Both maps must have equal projection
c. Both maps need to have the same scale.
d. Both maps must be on the same system
e. All of the above

**45.** How does living plants appear _____ on false –color Infra red images?

a. White
b. Black
c. Blue
d. Red
e. Violet