

NAME _____

***Remote Sensing of the Environment
GEOG/GEOL 4093/5093
Spring Semester 2008***

***Lab Exercise #1 09/04/2008
Due: 09/11/2008***

(1) Send an email to Khalid at Khalid.Hussein@colorado.edu. This will be used to compile a class email list. (1)

(2) What is remote sensing? (4)

(3) Fill in the blanks in the following table: (8)

Wavelength	Frequency	Name of spectral region
a. _____	88.5 MHz	_____
b. 1.0 km	_____	_____
c. _____	37 GHz	_____
d. 600 nm	_____	_____
e. 10 μm	_____	_____
f. _____	60 Hz	_____
g. 5.0 cm	_____	_____
h. _____	1360 kHz	_____

(4) What are the peak wavelengths of blackbody emission for objects at the following temperatures? (3)

- a. 320 K _____
- b. 5700 K _____
- c. 1.0×10^6 K _____

(5) Use the infrared thermometer to measure the temperature of the wall. Note that temperature here _____. Use the infrared thermometer to measure the temperature of the top of a computer monitor. Note that temperature here _____. What is the amount of radiation (Wm^{-2}) being emitted from the wall and from the computer? Use an emissivity of 0.97 for all measurements. Show your work below. (6)

(6) Describe Wien's displacement law. What does it tell us about the relationship between temperature and wavelength? (4)

(7) Using an initial temperature of 20 °C and an uncertainty of $\pm 5\%$, discuss the sensitivity of the Stefan-Boltzmann law for obtaining emittance. *You may need another sheet of paper to show all of your work.* (4)