Name: _____   Score: _____/100

Remote Sensing Intro Test

Welcome to Remote Sensing! You get <u>50</u> minutes to take this test. The tiebreakers is: first, your Part V score, then your Part IV score, and so on... Good luck!

<u>Part I. Acronyms</u>: Write out the full name of each of these acronyms. Each acronym is worth 1 point.

1. AMSR-E

2. CERES

3. MODIS

4. CALIPSO

5. CLOUD-SAT

6. OCO-2

7. AURA

8. LiDAR

9. RADAR

10. WiFS

Part I Score: ___/10

<u>Part II. Satellite Trivia</u>: Answer each satellite question. Each question is worth 2 points.

11. What was the first satellite launched in space called?

12. When did the AMSR-E spin down to 0 rpm?

13. How is LiDAR mechanistically different from RADAR?\

14. What is another name for LiDAR?

15. In which year was MODIS first launched into orbit?

16. How many A-Train satellites are currently active?

17. Formally define remote sensing.

18. What is a composite, in the context of remote sensing?

19. What is the difference between active and passive sensing?

20. Allie shines a special flashlight and determines that the light combing out of her flashlight has a frequency of 10^{14} hz. What type of light is Allie's flashlight emitting? Be as specific as possible!

2 Point Bonus Question! If you made a remote sensing image using the type of light coming out of Allie's flashlight, what would the image be most useful at showing?

Part II Score: ___/20

Answer each question on the physics of remote sensing. Each question is worth 5 points. Partial credit is available.

21. Assume that LAN is an example of a perfect blackbody radiator. Assume that the wavelength of LAN is 4.0 * 10^{-7} m. Determine the temperature at the surface of this star.

22. Consider our Sun, which has a surface temperature of 5,530 degrees Celsius. Determine the total intensity of the Sun. Express your answer in J/(s*m^2).

<u>Part IV. Climate Change Concepts:</u> Answer each question on the impacts of climate change. Each question is worth 2 to 4 points.

23. List and write the corresponding chemical formulas for each of the four major greenhouse gases, excluding ozone. (4 pts)

24. Define albedo. (2 pts)

25. What percentage of total world production of carbon dioxide do the developed countries contribute? (2 pts)
    A. less than 1%
    B. about 25%
    C. about 50%
    D. about 75%
    E. about 90%

26. Which of the following best describes the mechanism of the greenhouse effect in Earth's atmosphere? (2 pts)
    A. Ultraviolet radiation from the Sun is absorbed by ozone gas in the atmosphere.
    B. Gamma radiation from the Sun is absorbed at ground level by dust particles in the atmosphere.
    C. Infrared radiation from Earth's surface is absorbed by gases in the atmosphere.
    D. Cosmic radiation from deep space is absorbed by gases in the atmosphere.
    E. Alpha radiation from the Sun is absorbed by water vapor in the atmosphere.

Part IV Score: ___/10

<u>Part V. Map Reading:</u> Read each image then answer the questions that follow. The questions about each image are worth a total of 10 points, but may not be equally weighted.
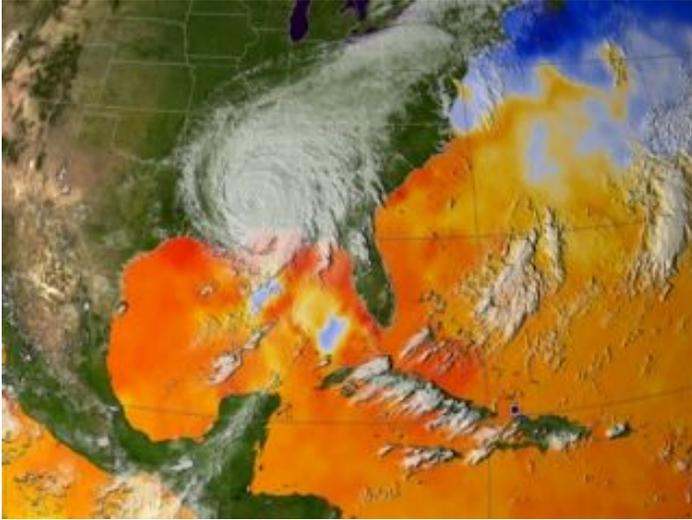
<u>Image 1</u>

27. Which satellite took this image? (2 pts)

28. What type of sensor took this image? (2 pts)

29. What does the white part in the image represent? (2 pts)

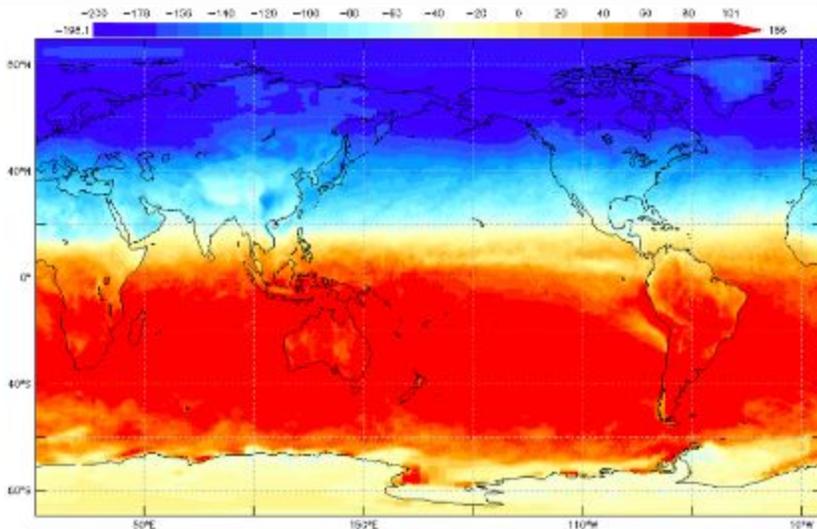30. What do the orange and red in the image represent? (4 pts)

<u>Image 2</u>

31. What instrument took this image? (2 pts)

32. What do the red areas represent? (2 pts)

33. What do the blue areas represent? (2 pts)

34. What season was the Northern Hemisphere in when this picture was taken? (2 pts)

35. Name one factor that could cause an area of the map to become more blue. (2 pts)

Image 3

36. What instrument took this image? (2 pts)

37. What kind of image is this? (1 pt)

38. What country is depicted in the image? [Hint: the image might not show all of the country] (2 pts)

39. What could the dark green represent? (1 pt)

40. What is responsible for the greenish color of some of the water in the image? (2 pts)

41. What does the white in the upper right corner of the image represent? (2 pts)

Image 4

2008/08/05 – CloudSat Reflectivity Z
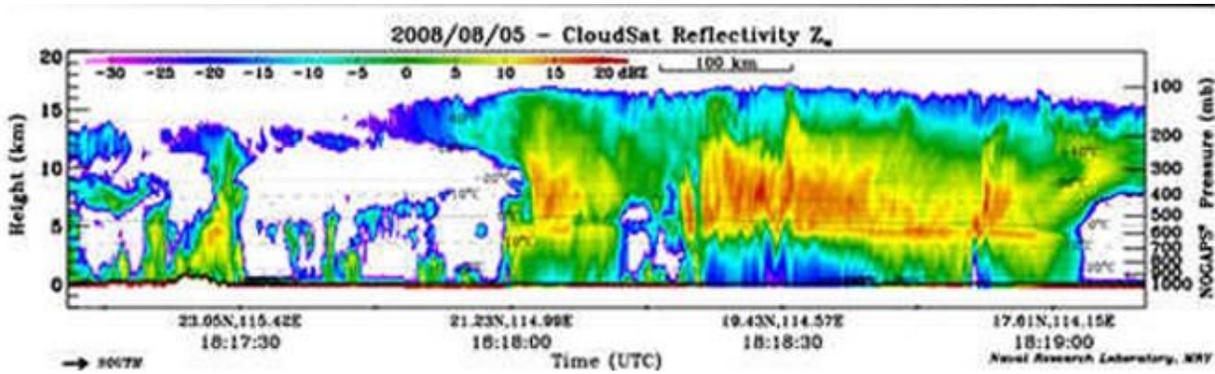
42. What satellite took this image? (1 pt)
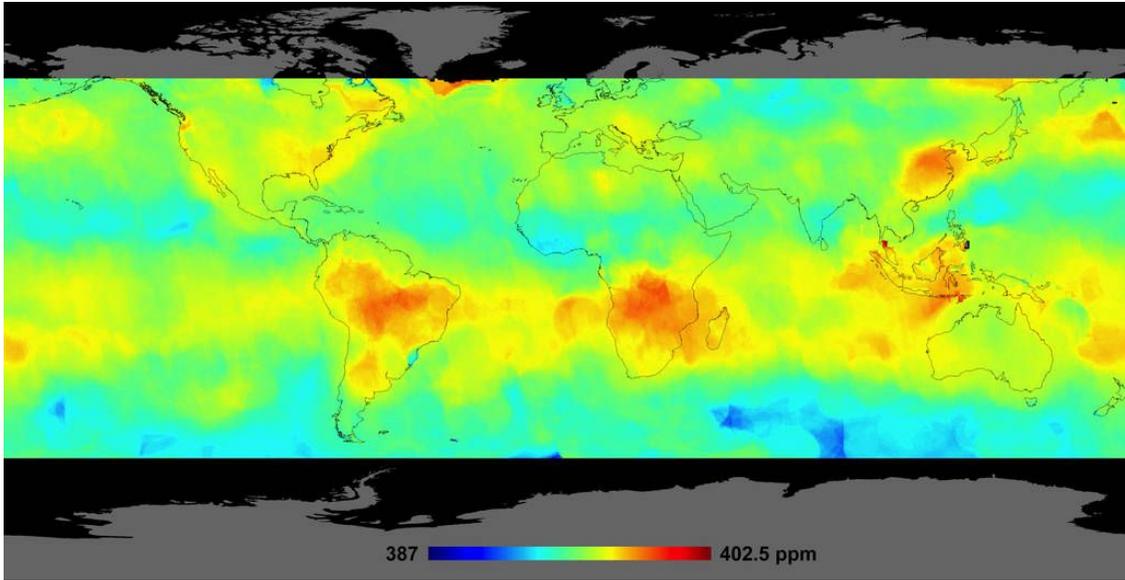
43. What does this image represent? (2 pts)

44. What do the blue areas towards the top of this image represent? (2 pts)

45. What do the red colors in the image represent? (1 pt)

46. What would you physically find if you flew a plane through the areas in the red? (1 pt)

47. This image relates to the radiative effect. Briefly explain what the radiative effect is. (3 pts)

48. What satellite took this image? (2 pts)

49. What was measured by the satellite that took this remote sensing image? (2 pts)

50. Why is much of southern Africa red? (2 pts)

51. Why is much of northern China red? (2 pts)

52. Why are some areas of the map shaded black and gray? (2 pts)

Part V Score: ___/50