**Chapter 10**

**How Remote Sensing Works**

1. Remote sensing is actually capturing:

 a. reflected vegetation.

 b. RBG color space.

 c. reflected light.

 d. infrared energy.

2. Which of the following is NOT true of remote sensing?

 a. Remote sensing captures a form of electromagnetic energy.

 b. The device capturing the information about energy reflectance will be airborne.

 c. The remote sensing device is mounted at the top of skyscrapers in major cities.

 d. Some, but not all, remote sensing devices measure the energy emitted from objects on the ground.

3. The source of electromagnetic energy is:

 a. Alpha Centauri.

 b. the sun.

 c. the moon.

 d. nearby planets such as Venus or Mars.

4. Sunlight takes about 8.3 hours to reach Earth.

a. True

b. False

5. In passive remote sensing, the sensor simply measures reflected or emitted energy.

 a. True

 b. False

6. Radar is a good example of passive remote sensing.

 a. True

 b. False

7. The type of remote sensing in which the sensor generates its own energy, casts it at a target, and then measures the return of that form of energy, is:

 a. infrared remote sensing.

 b. passive remote sensing.

 c. ultraviolet remote sensing.

 d. active remote sensing.

8. In a long wavelength, waves occur more frequently.

 a. True

 b. False

9. Frequency times wavelength equals:

 a. spectrum.

 b. speed of sound.

 c. speed of light.

 d. speed of echo.

10. The speed of light is approximately:

a. 10 million miles per hour.

b. 400 million meters per minute.

c. 300 million meters per second.

d. impossible to measure accurately.

11. Which of the following is NOT a form of electromagnetic energy with short wavelengths?

 a. cosmic rays

 b. radio waves

 c. gamma rays

 d. x-rays

12. Microwaves are forms of electromagnetic energy with very long wavelengths.

 a. True

 b. False

13. The vast majority of the electromagnetic spectrum is invisible to the human eye.

 a. True

 b. False

14. Human beings can see reflections of light that have wavelengths between \_\_\_\_ and \_\_\_\_ micrometers.

 a. .1, .6

 b. .2, .5

 c. .3, .8

 d. .4, .7

15. The color seen at the highest end (i.e. longest wavelength) of the visible spectrum is:

 a. yellow.

 b. red.

 c. green.

 d. blue.

16. The color seen at the lowest end (i.e. shortest wavelength) of the visible spectrum is:

 a. yellow.

 b. red.

 c. green.

 d. blue.

17. The portion of the electromagnetic spectrum just beyond that visible to the human eye is composed of:

 a. gamma rays.

 b. radio waves.

 c. x-rays.

 d. infrared light.

18. Which type of infrared light is used for measuring heat sources?

 a. NIR

 b. SWIR

 c. TIR

 d. FIR

19. A considerable portion of the sun’s electromagnetic energy never reaches the ground.

 a. True

 b. False

20. Which type of electromagnetic energy is absorbed by ozone?

 a. infrared energy

 b. gamma rays

 c. ultraviolet light

 d. the visible spectrum

21. Which of the following parts of the electromagnetic spectrum is NOT an atmospheric window?

 a. the visible light wavelengths

 b. portions of the infrared section

 c. portions of the thermal infrared section

 d. the ultraviolet spectrum

22. Which is NOT a type of scattering?

 a. Zelix scattering

 b. nonselective scattering

 c. Mie scattering

 d. Rayleigh scattering

23. The type of scattering that helps explain why we see the sky as blue is:

 a. Mie scattering.

 b. Rayleigh scattering.

 c. nonselective scattering.

 d. selective scattering.

24. The total amount of energy that strikes a surface is called:

 a. transmittance energy.

 b. absorption energy.

 c. reflectance energy.

 d. incident energy.

25. \_\_\_\_\_\_\_\_\_\_\_ occurs when a wavelength of energy passes through a surface, and \_\_\_\_\_\_\_\_\_\_ occurs when energy is trapped and held by a surface.

a. Transmission; absorption

b. Absorption; reflectance

c. Scattering; spectral reflectance

d. Incident energy; spectral energy

26. Spectral reflectance is the percentage of the total incident energy that was reflected from a surface.

 a. True

 b. False

27. Incident energy is the sum total of transmitted and absorbed energy.

a. True

b. False

28. Healthy vegetation will have a weak reflection of near-infrared energy and absorption of green energy.

 a. True

 b. False

29. Healthy vegetation would be more likely to have an NDVI value of .14 than .72.

 a. True

 b. False

30. Almost everything on Earth’s surface reflects energy in the same way.

a. True

b. False

31. Most of Africa’s vegetation is found south of the Sahel.

 a. True

 b. False

32. The spatial resolution of Landsat imagery (except for the panchromatic band) is:

 a. 10 feet × 10 feet.

 b. 20 meters × 20 meters.

 c. 30 meters × 30 meters.

 d. 40 kilometers × 40 kilometers.

33. A finer resolution allows the eye to see more detail.

 a. True

 b. False

34. In 8-bit imagery, the highest value in the brightness value range is:

 a. 17.

 b. 127.

 c. 206.

 d. 255.

35. In 8-bit imagery, a value of zero represents which color?

 a. white

 b. black

 c. gray

 d. red

36. In 8-bit imagery, a value of 255 represents which color?

 a. white

 b. black

 c. gray

 d. red

37. Hyperspectral imagery is made possible by a sensor capable of sensing hundreds of bands of energy simultaneously.

 a. True

 b. False

38. Panchromatic imagery is displayed in black and white.

 a. True

 b. False

39. Which gun is NOT used to create a color composite?

 a. red gun

 b. green gun

 c. yellow gun

 d. blue gun

40. In a standard false color composite, healthy grass is displayed as \_\_\_\_\_\_\_\_\_\_\_ while water is displayed as \_\_\_\_\_\_\_\_\_.

 a. green; blue

 b. red; black

 c. black; white

 d. blue; red