

Guide to Wireless Communications, Third Edition

Chapter 2

Review Questions

1. Which range of the electromagnetic spectrum is less susceptible to interference from sources of visible light?
 - a. ultraviolet
 - b. gamma light
 - c. infrared
 - d. yellow light
- e. The distance between one positive peak and the next positive peak of a wave is called: _____.
- f. frequency
- g. wavelength
- h. elasticity
- i. intensity
- j. Which type of transmission is used when human voice is modulated directly onto a carrier wave?
 - k. analog
 - l. digital
 - m. diffused

- n. directed
- o. Why do computers and data transmission equipment use binary?
- p. They are electrical devices, and electricity has only two states.
- q. Base 2 is too difficult to use.
- r. Base 10 was developed before binary.
- s. Binary is the next step beyond quadecimal.
- t. Eight binary digits grouped together form which of the following?
- u. byte
- v. bit
- w. binary
- x. 2x quad
- y. The American Standard Code for Information Interchange (ASCII) can represent up to 1024 characters. True or False?
- z. Letters of the alphabet and symbols are stored using the ASCII code, but not numbers used in calculations. True or False?
- aa. Infrared light, though invisible, has many of the characteristics of visible light. True or False?
- bb. Infrared wireless systems require that each device have only one component: either an emitter that transmits a signal or a detector that receives the signal. True or False?

cc. Infrared wireless systems send data by the intensity of the light wave instead of whether the light signal is on or off. **True** or False?

dd. Infrared wireless transmission can be either directed or _____.

ee. analog

ff. digital

gg. diffused

hh. detected

ii. Radiotelephony or radio travels in waves known as _____ waves.

jj. electromagnetic

kk. analog

ll. magnetic

mm. electrical

nn. Unlike a digital signal, a(n) _____ signal is a continuous signal with no “breaks” in it.

oo. magnetic

pp. visible

qq. light

rr. analog

ss. Changing a signal to encode data onto it is known as _____.

tt. baud

uu. demodulation

vv. modulation

ww. continuity

xx. PSK is an example of _____.

yy. ASCII encoding

zz. unicoding

aaa. phase modulation

bbb. digital modulation

ccc. Explain how a radio antenna works when transmitting a signal.

When the electricity moves back and forth in the antenna at the same frequency as the radio waves, it creates both a magnetic field and an electrical field around the antenna. This continuous (analog) combination of magnetism and electrical pressure moves away (propagates) from the antenna the same way that water waves move away from the point of impact when you throw a rock in a pond.

2. Explain the difference between bps and baud rate.

Baud rate refers to the number of signal changes per second. Because each signal change can represent more than one bit, the number of bits-per-second, or bps, can be higher than the baud rate.

3. Explain the difference between amplitude modulation, frequency modulation, and phase modulation.

Amplitude modulation changes the height of a wave. Frequency modulation changes the frequency of a wave, and phase modulation changes the starting point of a wave with reference to the previous cycle of the same wave.

4. What is quadrature amplitude modulation (QAM) and how does it work?

QAM is a modulation method that changes both the phase and height of a wave, in order to encode more than one bit per signal change (baud).

5. List and describe the three different types of binary signaling techniques.

In return-to-zero, the absence of a voltage, or zero volts, represents a 0 bit and an increase in voltage represents a 1 bit. The signal rises and falls within a bit time period. In non-return-to-zero, the voltage does not change when the next bit is the same as the previous bit. Non-return to zero level, works the same way as non-return-to-zero, but the voltage changes between a positive and negative level, rather than between a positive voltage and zero volts, as in the previous two techniques.