

Introduction to Wireless Technology

1. What was the first form of wireless used?
 - a. Garage door openers
 - b. Telegraphy
 - c. Two way radios
 - d. Wireless local area networks
2. Which form of wireless has greatly impacted society in the 21st century?
 - a. CB radios
 - b. Cell phones
 - c. FM radio
 - d. Satellites
3. Wireless radio really did not advance until the development of the _____.
 - a. Dipole antenna
 - b. MOSFET
 - c. Transistor
 - d. Vacuum tube
4. Due to semiconductor advances, a complete radio can be built on a single chip.
 - a. True
 - b. False
5. In order to transmit data, it must first be put into what form.
 - a. Amplified analog form
 - b. Electrical signal
 - c. Magnetic signal
 - d. All of the above will work
6. A baseband signal is another name for the
 - a. Conditioned or enhanced signal
 - b. Noise signal detected
 - c. Original information signal
 - d. Received signal
7. What is a “medium” in a communication system?
 - a. Boundary found in the transmitter to separate data
 - b. Noise added to the original signal
 - c. Path which carries information from transmitter to receiver
 - d. Receiver which decodes the signal



8. Give one example of signal conditioning.
9. What is the medium used in radio communication?
 - a. Fiber optics
 - b. Free space
 - c. PC board
 - d. Twisted pair
10. Another name for unwanted random voltage is
 - a. Baseband signal
 - b. Gain
 - c. Noise
 - d. Peak voltage
11. What is another name for free space in radio transmission?
 - a. Dipole
 - b. Ether
 - c. Propagation
 - d. Sine wave
12. Which of the following is an example of a simplex system?
 - a. Cell phones
 - b. TV broadcasting
 - c. Walkie talkies
 - d. Wireless local area networks
13. The combination of a transmitter and a receiver is called a
 - a. Dual transmitter
 - b. Full receiver
 - c. Medium
 - d. Transceiver
14. In two-way communication, you must have a transceiver at each end of the communication link.
 - a. True
 - b. False
15. In which way can two-way communication be conducted?
 - a. Full duplex
 - b. Half duplex
 - c. Simplex
 - d. Both (a) and (b)
16. What is the difference between half duplex and full duplex?



17. Which of the following communication systems uses half duplex?
- Cell phone
 - Telephone
 - Two way radios
 - Wireless local area network
18. A magnetic field is a force created by
- A current flowing through a wire
 - A wire without current flow
 - One conductor with a voltage across it
 - Two conductors with a voltage applied across them
19. In a radio wave, the magnetic field is at a _____ angle to the electric field.
- 45°
 - 60°
 - 90°
 - 180°
20. The polarization of a radio wave is determined by the
- Angle between the two fields
 - Electric field
 - Magnetic field
 - None of the above
21. A radio signal is produced by a component known as a/an
- Antenna
 - Magnetic field
 - Medium
 - Transmitter
22. A dipole antenna is made of two conductors equal in length
- True
 - False
23. At approximately what speed does a radio signal propagate?
- Half the speed of light
 - The speed of light
 - Twice the speed of light
 - Not enough information
24. A received radio signal is usually in the _____ range.
- Microvolt
 - Volt
 - Kilovolt
 - Megavolt



25. What is the wavelength of a signal which operates at 100 MHz?
- 3 meters
 - 30 meters
 - 300 meters
 - 3000 meters
26. Another definition for wavelength is the
- Distance traveled by a wave in one cycle
 - Length of one half a wave
 - Percentage of a radio wave transmitted
 - Wavelength of a light wave
27. What frequencies are referred to as microwaves?
- Frequencies below 1 GHz
 - Frequencies below 300 MHz
 - Frequencies above 1 GHz
 - Frequencies from 300 MHz to 1 GHz
28. The highest frequency range is usually used by
- AM broadcasting
 - Amateur radio
 - Cell phones
 - Satellites and Radar
29. Which segment of the optical spectrum is usually found in wireless communication?
- Infrared
 - Visible
 - Ultra Violet
 - X-ray
30. If a radio wave hits a poor conductor, the wave will
- Be diffracted
 - Be reflected
 - Travel through it
 - Any of the above is possible
31. Conductors will cause a _____ phase shift in the incoming radio wave
- 60°
 - 90°
 - 180°
 - 360°
32. Radar works because large objects easily reflect incoming radio waves.
- True
 - False



33. Radio waves are refracted when they pass through medium of different
- Conductivity
 - Density
 - Humidity
 - Reflectivity
34. AM radio waves are an example of
- Ground waves
 - Side waves
 - Sky waves
 - Space waves
35. Ground waves are produced at frequencies below
- 3 MHz
 - 5 MHz
 - 30 MHz
 - 50 MHz
36. Sky waves travel up into the atmosphere and then are
- Absorbed by the ionosphere
 - Diffacted by the ozone
 - Directed in a straight line
 - Reflected back to earth
37. Space waves are signals produces at frequencies above
- 3 MHz
 - 5 MHz
 - 30 MHz
 - 50 MHz
38. Most hard wired applications use LOS transmission
- True
 - False
39. Modulation allows information signals like voice and video to be
- Transmitted by a very long antenna
 - Transmitted over long distances
 - Transmitted with other signal interference
 - None of the above
40. In frequency modulation and phase modulation, the _____ of the carrier signal remains constant.
- Amplitude
 - Cycle time
 - Frequency
 - Phase



41. Digital data modulates the carrier signal with binary pulses.
- True
 - False
42. In digital data modulation, On-Off keying is sometimes used in
- Amplitude shift keying
 - Frequency shift keying
 - Phase shift keying
 - Time shift keying
43. One of the most common modulation circuits is a QAM which is
- A combination of ASK and PSK
 - A combination of PSK and FSK
 - A completely new circuit design
 - None of the above
44. Multiplexing is used to allow more than one signal to
- Be modulated before transmission
 - Be transmitted at least 1 mile
 - Be transmitted concurrently on the same medium/channel
 - Occupy the same frequency
45. In frequency division multiplexing, carrier signals of different frequencies are
- Added together in the same band width
 - Each transmitted separately
 - Multiplied together as a master carrier signal
 - Subtracted from a master carrier signal
46. In frequency division multiplexing, each information signal
- Has a small bandwidth which fits inside the bandwidth of the medium
 - Has a bandwidth which is equal in size to the bandwidth of the medium
 - Has a bandwidth greater than the bandwidth of the medium
 - Has a bandwidth which is 2X greater than the bandwidth of the medium
47. The receiver of a multiplexed signal uses a _____ to separate the carrier signals.
- Band pass filter
 - High pass filter
 - Low pass filter
 - Notch filter
48. In time division multiplexing, _____ are used to digitize the information signal.
- Analog-to-digital converters
 - Demultiplexer
 - Digital-to-analog converters
 - Large amplifiers



49. The multiplexer of a time division system transmits one _____ at a time from each digitized signal.
- Bit
 - Sentence
 - Volt
 - Word
50. The receiver of the TDM system uses a _____ to sort out the individual words.
- Analog-to-digital converter
 - Demultiplexer
 - Digital-to-analog converter
 - Large amplifier
51. The local oscillator of the receiver allows
- A new information signal to be received
 - All noise to be filtered
 - For down conversion
 - The desired signal to be selected
52. The mixer produces the sum and difference frequencies of the received signal and _____ signal
- Low noise amplifier
 - Multiplexer
 - Noise
 - Oscillator
53. The lower frequency selected during down conversion is also known as the
- Alternate frequency (AF)
 - Center frequency (CF)
 - Intermediate frequency (IF)
 - Mid range frequency (MRF)
54. A receiver which performs down conversion is called a
- Embedded GPS receiver
 - Lower heterodyne receiver
 - Regenerative radio receiver
 - Superheterodyne receiver
55. The IF signal is then sent to the _____ where the original signal is recovered.
- Analog-to-digital converter
 - Demodulator
 - Operational amplifier
 - Output mixer



56. In an SDR receiver, the demodulator is replaced with an ADC and a
- D to A converter
 - Digital signal processor
 - Frequency synthesizer
 - Quartz crystal
57. The DSP performs all the following functions if needed EXCEPT
- A to D conversion
 - Decoding
 - Demodulation
 - Filtering
58. In a very simple transmitter, the carrier signal is generated by
- A crystal oscillator
 - A frequency generator
 - A frequency synthesizer
 - None of the above
59. In a simple transmitter, the information signal modifies the carrier signal in the
- Demodulator
 - DSP
 - Filter
 - Modulator
60. The maximum of output power a signal can radiate is controlled by the
- Federal Communication Commission
 - Federal Radio Wave Commission
 - Federal Trade Commission
 - Transmitting agent
61. A more complex transmitter is used with
- Walkie talkies
 - Wireless radios, which operate on multiple channels
 - Wireless remote toys
 - None of the above
62. In a more complex transmitter, the carrier frequency is generated by the
- Frequency generator
 - Frequency synthesizer
 - Mixer
 - Oscillator



63. The frequency of the carrier signal in a complex transmitter can be selected
- a. Automatically by the system
 - b. By the user from a keyboard
 - c. None of the above
 - d. Both of the above
64. The baseband section of a complex transmitter
- a. Generates a carrier signal
 - b. Prepares the original signal for modulation
 - c. Sends a code to the frequency synthesizer
 - d. Sets the bandwidth of the modulated signal