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| --- |
| **True / False** |

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| 1. A VoIP phone allows you to make calls over the Internet.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | |

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| 2. A WLAN is an extension of a wide area network.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| 3. UWB WiGig has a range of up to 100 meters at 7 Gbps.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| 4. The ZigBee Alliance protocols enable devices like light switches to communicate with one another.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | |

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| 5. RFID technology is implemented by roadside assistance services to link a vehicle and driver to a central service center that may be miles away.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| 6. 4G technology uses 100% analog transmission for voice and data.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| 7. An AP connects wireless devices to the wired LAN.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | |

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| 8. DSL is an Internet access technology that uses cable TV lines to make a network connection.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| 9. The job market for wireless LAN professionals is saturated and likely to decline in coming years.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| 10. One advantage of wireless technology is that it is immune to interference sources.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| **Multiple Choice** |

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| 11. What type of device is built into a tablet computer and can send data over radio waves to another device such as a laser printer?   |  |  |  | | --- | --- | --- | |  | a. | VoIP phone | |  | b. | wireless NIC | |  | c. | access point | |  | d. | Ethernet NIC |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 12. How can VoIP over Wi-Fi help save money?   |  |  |  | | --- | --- | --- | |  | a. | by eliminating the need for a phone | |  | b. | by saving on cellular phone bills | |  | c. | by reducing the cost of a smartphone | |  | d. | by not requiring an access point |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 13. Which RFID component powers the chip in the tag?   |  |  |  | | --- | --- | --- | |  | a. | RFID interrogator | |  | b. | RFID inactive tag | |  | c. | Key fob | |  | d. | NFC emitter |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 14. What is the typical range for the use of Bluetooth?   |  |  |  | | --- | --- | --- | |  | a. | meters to kilometers | |  | b. | yards to miles | |  | c. | inches to feet | |  | d. | millimeters to inches |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 15. With what technology will you find radio modules and link managers?   |  |  |  | | --- | --- | --- | |  | a. | RFID | |  | b. | GPS | |  | c. | Wi-Fi | |  | d. | Bluetooth |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 16. Which technology has a maximum range of about 2 meters when transmitting high quality audio and video wirelessly at up to 7 Gbps?   |  |  |  | | --- | --- | --- | |  | a. | Wi-Fi | |  | b. | Bluetooth | |  | c. | WiGig | |  | d. | RFID |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 17. Automatic connections between what type of devices create a piconet?   |  |  |  | | --- | --- | --- | |  | a. | VoIP | |  | b. | Infrared | |  | c. | Bluetooth | |  | d. | WirelessHD |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 18. In what type of wireless communication device will you find a repeater?   |  |  |  | | --- | --- | --- | |  | a. | satellite | |  | b. | NFC | |  | c. | antenna | |  | d. | WNIC |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 19. What kind of network is built around the concept of low-power transmitters built on towers that can use the same radio frequency channel?   |  |  |  | | --- | --- | --- | |  | a. | Wi-Fi 802.11 networks | |  | b. | cellular telephone networks | |  | c. | UWB A/V networks | |  | d. | GPS tracking networks |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 20. What type of cellular network uses 100 percent digital transmission for voice and data and can reach rates over 100 Mbps?   |  |  |  | | --- | --- | --- | |  | a. | CDMA | |  | b. | 4G | |  | c. | 3G | |  | d. | GSM |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 21. What kind of device does a WLAN use to facilitate communication between wireless computers?   |  |  |  | | --- | --- | --- | |  | a. | Ethernet switch | |  | b. | GPS hub | |  | c. | access point | |  | d. | cell station |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 22. Which wireless technology has a typical transfer rate of 1 Mbps to 3 Mbps at distances up to about 10 meters?   |  |  |  | | --- | --- | --- | |  | a. | ZigBee | |  | b. | NFC | |  | c. | Wi-Fi | |  | d. | Bluetooth |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 23. Which technology is intended to work at a distance of about 5 to 10 centimeters with transmission speeds of 250 Kbps?   |  |  |  | | --- | --- | --- | |  | a. | ZigBee | |  | b. | NFC | |  | c. | RFID | |  | d. | Bluetooth |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 24. Which communication technology should you use if you need to connect three offices which are all within 3 miles of each other at speeds up to 75 Mbps using antennas?   |  |  |  | | --- | --- | --- | |  | a. | T1 | |  | b. | DSL | |  | c. | WiMax | |  | d. | ISDN |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 25. Which cellular technology has theoretical downstream speeds of 1 Gbps and upstream speeds of 500 Mbps?   |  |  |  | | --- | --- | --- | |  | a. | LTE Advanced | |  | b. | Sirius XM | |  | c. | MDT | |  | d. | 802.16 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 26. What term refers to the combining of voice, video and text-processing and access to multiple network platforms from a single device?   |  |  |  | | --- | --- | --- | |  | a. | access aggregation | |  | b. | digital landscape | |  | c. | digital convergence | |  | d. | network transparency |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 27. What technology allows smartphones to use software that allows them to make phone calls over a wireless LAN instead of the cellular network?   |  |  |  | | --- | --- | --- | |  | a. | VLAN | |  | b. | WiMAx | |  | c. | ZigBee | |  | d. | VoIP |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 28. What are the small, low-power transceivers used by Bluetooth called?   |  |  |  | | --- | --- | --- | |  | a. | RFID tags | |  | b. | antennas | |  | c. | radio modules | |  | d. | NFC transmitters |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 29. What function is RFID likely to replace for the purpose of inventory management?   |  |  |  | | --- | --- | --- | |  | a. | NFC tags | |  | b. | APs | |  | c. | barcodes | |  | d. | interrogators |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 30. Why would you want to encrypt wireless data?   |  |  |  | | --- | --- | --- | |  | a. | protect privacy | |  | b. | prevent jamming | |  | c. | facilitate access | |  | d. | reduce health risks |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| --- |
| **Matching** |

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| Match each item with a statement below.   |  |  | | --- | --- | | a. | 3G | | b. | Bluetooth | | c. | DSL | | d. | 4g | | e. | link manager | | f. | NFC | | g. | T1 | | h. | USB | | i. | WiGig | | j. | ZigBee | |

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| 31. a digital cellular technology that can send data at up to 21 Mbps over the cellular network   |  |  | | --- | --- | | *ANSWER:* | a | |

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| 32. a wireless standard that enables devices to transmit data at an effective rate of 721.2 Kbps over short distances of up to 33 feet   |  |  | | --- | --- | | *ANSWER:* | b | |

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| 33. a technology used to transmit data at high speeds over a telephone line   |  |  | | --- | --- | | *ANSWER:* | c | |

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| 34. a cellular technology that can transmit and receive data at speeds over over 100 Mbps   |  |  | | --- | --- | | *ANSWER:* | d | |

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| 35. software in Bluetooth devices that helps identify other Bluetooth devices   |  |  | | --- | --- | | *ANSWER:* | e | |

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| 36. a technology that can be used to configure and activate a connection between two devices over Bluetooth or Wi-Fi   |  |  | | --- | --- | | *ANSWER:* | f | |

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| 37. a wired technology used to transmit data over telephone lines at 1.544 Mbps   |  |  | | --- | --- | | *ANSWER:* | g | |

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| 38. a common way of connecting peripherals such as flash drives to a computer   |  |  | | --- | --- | | *ANSWER:* | h | |

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| 39. a specification for connecting computers, communication, and entertainment devices over short ranges   |  |  | | --- | --- | | *ANSWER:* | i | |

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| 40. a specification used for home automation that can wirelessly control lighting, as well as security and energy systems   |  |  | | --- | --- | | *ANSWER:* | j | |

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| **Subjective Short Answer** |

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| 41. What are the potential health risks of using wireless devices?   |  |  | | --- | --- | | *ANSWER:* | Wireless devices contain radio transmitters and receivers that emit radio frequency (RF) energy. Typically, these wireless devices emit low levels of RF energy while being used. Scientists know that high levels of RF can produce biological damage through heating effects (this is how a microwave oven is able to cook food). However, it is not known if lower levels of RF can cause adverse health effects. Although some research has been done to address these questions, no clear picture of the biological effects of this type of radiation has been found to date. | |

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| 42. Describe how wireless networking can enhance a family's convenience in the kitchen.   |  |  | | --- | --- | | *ANSWER:* | A computer system installed in the refrigerator door lets you share a family schedule, make shopping lists, as well as exchange information through text messages or email with your computers, smartphones, and tablets. Because the refrigerator is also connected to the Internet through your Wi-Fi network, you can access this information even when you are not at home. | |

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| 43. Describe Bluetooth technology and how it can be used in a computing environment.   |  |  | | --- | --- | | *ANSWER:* | Bluetooth is a wireless standard designed to transmit data at very short ranges-typically, from a few inches to 33 feet (10 meters). The main purpose of short-range technologies such as Bluetooth is to eliminate cables between devices such as smartphones and computers, which allows data to be transmitted wirelessly between, say, a computer and a printer or a mobile telephone and a music player or a computer and a smartphone. | |

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| 44. Describe WiGig and how it might be used in the home.   |  |  | | --- | --- | | *ANSWER:* | WiGig is another short-range wireless technology designed for use primarily in the home; it can transmit larger quantities of data at much higher speeds. WiGig can send and receive CD- and DVD-quality audio and video as well as Blu-ray high-definition movies from entertainment equipment, computers, or mobile devices to a TV, for example | |

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| 45. What is a piconet?   |  |  | | --- | --- | | *ANSWER:* | A piconet consists of two or more Bluetooth devices that are exchanging data with each other. Up to seven devices can belong to a single Bluetooth WPAN. | |

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| 46. What does a repeater do in a satellite communication system?   |  |  | | --- | --- | | *ANSWER:* | In satellite communications, a device called a repeater is located in the satellite itself. An Earth station transmits to the satellite at one frequency band, and the satellite regenerates and transmits (repeats) the signal back to Earth on a different frequency. The transmission time needed to repeat a signal from one Earth station to another can be up to 250 milliseconds. | |

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| 47. How does a WLAN use an access point?   |  |  | | --- | --- | | *ANSWER:* | A WLAN is an extension of a wired LAN. Wireless devices connect to it through a wireless access point (wireless AP or just AP). The AP relays data signals between all the devices on the wired network, including file servers, printers, and even other access points and the wireless devices connected to the AP itself. | |

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| 48. Describe a WMAN and discuss a technology a WMAN might use.   |  |  | | --- | --- | | *ANSWER:* | A WMAN link can cover an area of about 25 square miles (40 square kilometers), and it can be used to carry data, voice, and video signals. Some WMANs today are based on the IEEE 802.16 (WiMAX) fixed broadband wireless standard and use radio waves for data communications. | |

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| 49. What is digital convergence and how might it affect how people use network devices?   |  |  | | --- | --- | | *ANSWER:* | Digital convergence refers to the power of digital devices-such as desk and laptop computers and wireless handhelds like smartphones-to combine voice, video, and text-processing capabilities as well as to be connected to business and home networks and to the Internet. The same concept applies to the development of VoIP networks, which use the same protocols and media (both wired and wireless) that once carried only data to carry two-way voice conversations. Wireless networks in general play an important part in digital convergence as users demand to be connected to their data and voice networks at all times, wherever they may be. | |

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| 50. Discuss how radio signal interference can affect wireless devices.   |  |  | | --- | --- | | *ANSWER:* | Because wireless devices operate using radio signals, the potential for two signals to interfere with each other exists. Virtually any wireless device can be a source of interference for other devices. Several common office devices emit signals that may interfere with the receivers in a WLAN. These devices include microwave ovens, elevator motors, and other heavy electrical equipment, such as manufacturing machines, photocopiers, certain types of outdoor lighting systems, theft protection systems, and cordless telephones. These may cause errors to occur in the transmission between a wireless device and an access point. In addition, Bluetooth, WLAN 802.11b/g/n, and ZigBee devices can all operate in the same radio frequency, potentially resulting in interference between such devices in spite of efforts to design these radios to automatically avoid interference. | |