CompTIA A+ Bible

1000+ Questions and Solutions

December 2020

1 Questions

1. What are the six step troubleshooting process?

   (a) Identify the problem

   (b) Establish a theory of probable cause. (Question the obvious)

   (c) Test the theory to determine cause

   (d) Establish a plan of action to resolve the problem and implement a solution

   (e) Verify full system functionality and, if applicable, implement preventative measures.

   (f) Document findings, actions, and outcomes

2. To which type of technology would you install a x16 card?

   (a) PCIe (Peripheral Component Interconnect express) is the most common expansion slot for video cards (by sixteen)

3. Which process of the computer checks all your components dur- ing boot?

   (a) POST (Power-On Self Test) is a process that is part of the BIOS (Basic Input Output System) or Unified Extensible Firmware Interface (UEFI). It runs a self-check of the computer system during boot and stores many of the parameters of the components within the CMOS.

4. Which of the following could cause the POST to fail? (Select the two best answers.)

   (a) The CPU and Memory need to be installed properly for the POST to run (and to pass).

5. Which of the following might you find as part of a tablet com- puter? (Select the two best answers.)

   (a) A tablet computer will almost always contain flash memory as main storage and multi-touch screen.

6. Which kind of socket incorporates "lands" to ensure connectiv- ity to a CPU?

    (a) LGA (land grid array) is the type of socket that uses "lands" to connect the socket to the CPU.

7. How many pins are inside an SATA 3.0 data connector?

    (a) The SATA version 3.0 data connector has seven pins. Note: SATA express uses a tiple connector with 18 pins (7 + 7 + 4)

8. What is the minimum number of hard drives necessary to imple- ment RAID 5?

    (a) Because RAID 5 uses striping with parity, a third disk is needed. You can have more than three disks as well.

9. A user's time and date keep resetting to January 1, 2012. Which of the following is the most likely cause?

    (a) If the time and date keep resetting - for example, to a date such as January 1,2012 - chances are that the lithium battery needs to be replaced. These are usually nickle-sized batteries; most PCs use a CR2032 lithium battery.

10. Which type of adapter card is normally plugged into a PCIe x16 adapter card slot?

    (a) The PCI Express (PCIe) x16 expansion slot is used primarily for video.

11. Which of the following CPU cooling methods is the most com- mon?

    (a) The most common CPU cooling method is the heat sink and fan combination. The heat sink helps the heat to disperse away from the CPU, whereas the fan blows the heat down and through the fins; the power supply exhaust fan and possibly addi- tional case fans help the heat escape the case. Heat sink and fan combinations are known as active cooling methods.

12. What type of power connector is used for a x16 video card?

    (a) PCIe 6-pin

13. What does the b in 1000 Mbps stand for?

    (a) The b in 1000 Mbps stands for bits: 1000 Mbps is 1000 megabits per second or 1 gigabit per second. Remember that the lowercase b is used to indicate bits when measuring net- work data transfer rates, USB data transfer rates, and other simi- lar serial data transfers.

14. When running cable through drop ceilings, which type of cable do you need?

   (a) Plenum-rated cable needs to be installed wherever a sprinkler system is not able to spray water. This includes ceil- ings, walls, and plenums (airways). Plenum-rated cable has a pro- tective covering that burns slower and gives off fewer toxic fumes than regular PVC-based cable.

15. Which of the following is the default subnet mask for IP address 192.168.1.1?

   (a) 192.168.1.1, by default, has the subnet mask 255.255.255.0, which is the standard subnet mask for class C IP addresses. However, remember that some networks are classless, which means that a network can use a different subnet mask.

16. Which of the following is the minimum category cable needed for a 1000BASE-T network?

   (a) The minimum cable needed for 1000BASE-T net- works is Category 5e. Of course, Cat 6 would also work, but it is not the minimum of the listed answers. 1000BASE-T specifies the speed of the network (1000 Mbps), the type (baseband, single shared channel), and the cable to be used (T = twisted pair).

17. Which of the following IP addresses can be routed across the In- ternet?

   (a) The only listed answer that is a public address (needed to get onto the Internet) is 129.52.50.13

   (b) All the other answers are private IPs, meant to be behind a fire- wall. 127.0.0.1 is the IPv4 local loopback IP address. 192.168.1.1 is a common private IP address used by SOHO networking devices. 10.52.50.13 is a private address. Note that the 10 network is common in larger networks.

18. Which port number is used by HTTPS by default?

   (a) The Hypertext Transfer Protocol Secure (HTTPS) uses port 443 (by default).

   (b) Port 21 is used by the File Transfer Protocol (FTP). Port 25 is used by the Simple Mail Transfer Protocol (SMTP). Port 80 is used by regular HTTP, which is considered to be insecure.

19. Which of the following cable types have a copper medium? (S- elect the three best answers.)

   (a) Twisted-pair, coaxial, and Category 7 cable are all examples of net- work cables with a copper medium. They all send electricity over copper wire.

(b) ultimode is a type of fiber-optic cable; it uses light to send data over a glass or plastic medium. Twisted pair is the most common type of cabling used in today's net- works.

20. Which of the following cable types can protect from electromag- netic interference (EMI)? (Select the two best answers.)

    (a) Shielded twisted pair (STP) and fiber optic can protect from EMI.

    (b) Unshielded twisted pair (UTP) cannot pro- tect from EMI. Un- less otherwise mentioned, Category 6 cable is UTP. STP is shielded twisted pair. Unlike UTP (unshielded twisted pair), STP provides an aluminum shield that protects from EMI. UTP and coaxial have no such protection. Fiber optic uses a different medium altogether, transmitting light rather than electricity; therefore, EMI cannot af- fect fiber-optic cables.

21. You are configuring Bob's computer to access the Internet. Which of the following are required? (Select all that apply.)

    (a) To get on the Internet, the DNS server address is required so that the computer can get the resolved IP addresses from the domain names that are typed in. The gateway address is necessary to get outside the network.

22. A customer wants to access the Internet from many different loca- tions in the United States. Which of the following is the best tech- nology to enable the customer to do so?

    (a) Cellular WAN uses a phone or other mobile device to send data over standard cellular connections.

23. You just configured the IP address 192.168.0.105 in Windows. When you press the Tab key, Windows automatically configures the default subnet mask of 255.255.255.0. Which of the following IP addresses is a suitable gateway address?

    (a) 192.168.0.1 is the only suitable gateway address. Remember that the gateway address must be on the same net- work as the computer. In this case, the network is 192.168.0, as defined by the 255.255.255.0 subnet mask.

24. You have been tasked with blocking remote logins to a server. Which of the following ports should you block?

    (a) ort 23 should be blocked. It is associated with the Telnet service, which is used to remotely log in to a server at the command line. You can block this service at the company fire- wall and individually at the server and other hosts. It uses port 23 by default, but it can be used with other ports as well. Telnet is considered to be insecure, so it should be blocked and disabled.

25. Which of the following connector types is used by fiber-optic ca- bling?

   (a) The LC connector is used by fiber-optic cabling. Other fiber connec- tors include SC and ST.

   (b) RJ45 is the connector used by twisted-pair networks. RG-6 is the cable used by cable Internet and TV; an F- connector is attached to the ends of an RG-6 cable. RJ11 is the standard phone line connector.

26. Which protocol uses port 53?

   (a) The Domain Name System (DNS) protocol uses port 53 by default.

   (b) TP uses port 21. SMTP uses port 25 (or 587 or 465). HTTP uses port 80.

27. Which of the following terms best describes two or more LANs connected over a large geographic distance?

   (a) A wide-area network (WAN) is a network in which two or more LANs are connected over a large geographic dis- tance—for example, be- tween two cities. The WAN requires con- nections to be provided by a telecommunications or data commu- nications company.

28. Which device connects to the network and has the sole purpose of provid- ing data to clients?

   (a) Network-attached storage (NAS) devices store data for network use. They connect directly to the network.

29. You are making your own networking patch cable. You need to attach an RJ45 plug to the end of a twisted-pair cable. Which tool should you use?

   (a) Use an RJ45 crimper tool to permanently attach RJ45 plugs to the end of a cable

30. Which port is used by RDP?

   (a) The Remote Desktop Protocol (RDP) uses port 3389 by default. This protocol allows one computer to take control of another remote system.

31. Which of the following printer failures can be described as a con- dition in which the internal feed mechanism stopped working temporarily?

   (a) A failure that occurs due to the internal feed mech- anism stopping is known as a paper jam. For example, an HP LaserJet might show error code 13.1 on the display, which means a paper jam at the paper feed area. You should verify that the pa- per trays are loaded and adjusted properly.

32. Which type of printer uses a toner cartridge?

    (a) Laser printers use toner cartridges.

33. Which of the following should not be connected to a UPS?

    (a) Laser printers use large amounts of electricity, which in turn could quickly drain the battery of the UPS. They should be plugged in to their own individual power strips.

34. Special paper is needed to print on which type of printer?

    (a) Regular paper can be used on all the listed printers except for thermal printers, which use specially coated paper that is heated to create the image.

35. Which of the following channels should you select for an 802.11 wireless network?

    (a) Of the listed answers, use channel 6 for 802.11 wireless networks. That would imply a 2.4 GHz connection using either 802.11n, g, or b. The 2.4 GHz frequency range in the United States allows for channels 1 through 11.

36. Which environmental issue affects a thermal printer the most?

    (a) Which type of printer uses impact to transfer ink from a ribbon to the paper?

37. Which of the following steps enables you to take control of a net- work printer from a remote computer?

    (a) After you install the driver for the printer locally, you can then take control of it by going to the properties of the printer and accessing the Ports tab. Then click the Add Port but- ton and select the Standard TCP/IP Port option. You have to know the IP address of the printer or the computer that the printer is connected to.

38. A color laser printer produces images that are tinted blue. Which of the following steps should be performed to address this prob- lem?

    (a) After you install a printer, it is important to cali- brate it for color and orientation, especially if you are installing a color laser printer or an inkjet printer. These calibration tools are usually built in to the printer's software and can be accessed from Windows, or you can access them from the printer's display.

39. A desktop computer does not have a lit link light on the back of the computer. Which of the following is the most likely reason for this?

(a) The most likely answer in this scenario is that the network cable is disconnected. If the desktop computer is using a wired connection, it is most likely a twisted-pair Ethernet con- nection. When this cable is connected to the computer on one end and to a switch or other central connecting device on the other end, it initiates a network connection over the physical link. This link then causes the network adapter's link light to light up. The link light is directly next to the RJ45 port of the network adapter. The corresponding port on the switch (or other similar device) is also lit. If the cable is disconnected, the link light becomes unlit, though there are other possibilities for this link light to be dark— for example, if the computer is off or if the switch port is dis- abled.

40. Which of the following IP addresses would a technician see if a computer running Windows is connected to a multifunction net- work device and is attempting to obtain an IP address automati- cally but is not receiving an IP address from the DHCP server?

    (a) If the computer fails to obtain an IP address from a DHCP server, Windows will take over and apply an Automatic Private IP Address (APIPA). This address will be on the 169.254.0.0 network.

41. For which type of PC component are 80 mm and 120 mm com- mon sizes?

    (a) Case fans are measured in mm (millimeters); 80 mm and especially 120 mm are very common. They are used to exhaust heat out of the case. These fans aid in keeping the CPU and other devices cool. The 120 mm is quite common in desktop and tower PCs, and the 80 mm is more common in smaller sys- tems and 1U and 2U rackmount servers.

42. An exclamation point next to a device in the Device Manager in- dicates which of the following?

    (a) If you see an exclamation point in the Device Man- ager, this indicates that the device does not have a proper driver.

43. Beep codes are generated by which of the following?

    (a) As the power-on self-test (POST) checks all the components of the computer, it may present its findings on the screen or in the form of beep codes.

44. Which of the following indicates that a printer is network-ready?

    (a) The RJ45 jack enables a connection to a twisted- pair (most likely Ethernet) network. Printers with a built-in RJ45 connector are network-ready; so are printers that are Wi-Fi en- abled.

45. You just turned off a printer to maintain it. Which of the follow- ing should you be careful of when removing the fuser?

   (a) The fuser heats paper to around 400° Fahrenheit (204° Celsius). That's like an oven. If you need to replace the fuser, let the printer sit for 10 or 15 minutes after shutting it down and before maintenance.

46. Which of the following connectors is used for musical equipment?

   (a) The Musical Instrument Digital Interface (MIDI) connector is used for musical equipment such as keyboards, syn- thesizers, and se- quencers. MIDI is used to create a clocking sig- nal that all devices can synchronize to.

47. Which of the following storage technologies is used by hard disk drives?

   (a) Hard disk drives (HDDs) are magnetic disks. Th- ese are the type with moving parts, as opposed to solid-state drives (SSDs) that have no moving parts.

48. Which protocol uses port 389?

   (a) LDAP

49. Which of the following wireless networking standards operates at 5 GHz only? (Select the two best answers.)

   (a) : 802.11a operates at 5 GHz only; so does 802.11ac.

50. Which of the following types of RAM has a peak transfer rate of 21,333 MB/s?

   (a) DDR4-2666 has a peak transfer rate of 21,333 MB/s. It runs at an I/O bus clock speed of 1333 MHz and can send 2666 megatransfers per second (MT/s). It is also known as PC4-21333.

51. Which of the following types of printers uses a print head, ribbon, and tractor feed?

   (a) The impact printer uses a print head, ribbon, and tractor feed. An example of an impact printer is the dot matrix.

52. Which of the following is a possible symptom of a failing CPU?

   (a) If the CPU is running beyond the recommended voltage range for ex- tended periods of time, it can be a sign of a failing CPU. The problem could also be caused by overclocking. Check in the UEFI/BIOS to see whether or not the CPU is over- clocked.

53. Which of the following cable types is not affected by EMI but re- quires specialized tools to install?

(a) Fiber-optic cable is the only answer listed that is not affected by electromagnetic interference (EMI). The reason is that it does not use copper wire or electricity, but instead uses glass or plastic fibers and light.

54. Setting an administrator password in the BIOS accomplishes which of the following?

(a) Changing boot order

55. What is an LCD display's contrast ratio defined as?

(a) Contrast ratio is the brightness of the brightest color (measured as white) compared to the darkest color (mea- sured as black). Static contrast ratio measurements are static; they are performed as tests using a checkerboard pattern. But there is also the dynamic contrast ratio, a technology in LCD displays that adjusts dynamically during darker scenes in an attempt to give better black levels. It usually has a higher ratio, but it should be noted that there is no real uniform standard for measuring con- trast ratio.

56. Which of the following devices limits network broadcasts, seg- ments IP address ranges, and interconnects different physical me- dia?

(a) A router can limit network broadcasts through seg- menting and programmed routing of data. This is part of a router's job when connecting two or more networks. It is also used with different media. For example, you might have a LAN that uses twisted-pair cable, but the router connects to the Inter- net via a fiber-optic connection. That one router will have ports for both types of connections.

57. Which of the following traits and port numbers are associated with POP3? (Select the two best answers.)

(a) OP3 is a protocol used by email clients to receive email. It makes use of either port 110 (considered insecure) or port 995 (a default secure port).

58. Which of the following uses port 427?

(a) The Service Location Protocol (SLP) uses port 427. It enables access to network services without previous con- figuration of the client computer.

59. Which of the following ports is used by AFP?

(a) The Apple Filing Protocol (AFP) uses port 548. AFP offers file services for Mac computers running macOS and can transfer files across the network.

60. Which of the following is the minimum amount of RAM needed to install a 64-bit version of Windows 10?

    (a)

61. (a)

62. (a)

63. (a)

64. (a)

65. (a)

66. (a)

67. (a)

2 Chapter 9

3 Tables

Technology	Full Name	Port
SLP	Service Location Protocol	427
FTP	File Transfer Protocol	21
DNS	Domain Name System	53
AFP	Apple Filing Protocol	548
HTTP	HyperText Transfer Protocol	80
SSH	Secure Shell	22
Telnet	Teletype Network	23
IMAP	Internet Message Access Protocol	143

4 Troy McMillan compTIA A+

4.1 Mobile Devices

1. What is the maximum transmission speed of an ExpressCard in PCIe2 mode?

   - D) The maximum transmission speeds are as follows: 280 Mbps effective (USB 2 mode)
     1.6 Gbps effective (PCIe 1 mode)
     3.2 Gbps effective (PCIe 2 or USB 3 mode)

2. Which interface is natively found only in Apple devices?

   - C) Thunderbolt ports are most likely to be found on Apple laptops, although they are now showing up on others as well. USB ports are typically found on all mobile devices, while Serial and PS/2 connecters are rarely found on mobile devices.

3. What special screwdriver is typically required to work on a notebook?

   - B) Some models of notebook PCs require a special T-8 Torx screwdriver. Most PC toolkits come with a T-8 bit for a screwdriver with interchangeable bits, but you may find that the T-8 screws are countersunk in deep holes so that you can't fit the screwdriver into them. In such cases, you need to buy a separate T-8 screwdriver, available at most hardware stores or auto parts stores. Phillips-head screwdrivers have a cross pattern on the tip and may be required. Hex heads are another type you may encounter, and metric drivers are those that are sized with the metric system.

4. What is the easiest thing to damage when removing a laptop keyboard?

   - B) When replacing the keyboard, one of the main things you want to keep in mind is to not damage the data cable connector to the system board.

5. Which component if damaged can render the hard drive useless?

   - C) If required, remove the connector attached to the old drive's signal pins and attach it to the new drive. Make sure it's right side up and do not force it. Damaging the signal pins may render the drive useless. The caddy, rails, and chassis are not easily damaged.

6. What size hard drive goes in a laptop?

   - C) The 2.5-inch hard drives are smaller (which makes them attractive for a laptop where space is at a minimum); however, in comparison to 3.5-inch hard drives, they have less capacity and cache, and they operate at a lower speed.

7. Which is not an advantage of solid-state drives?

   - A) The advantage of solid-state drives is that they are not as susceptible to damage if the device is dropped, and they are, generally speaking, faster as no moving parts are involved. They are, however, more expensive, and when they fail they don't generally give some advance symptoms like a magnetic drive will do.

8. Which display uses a row of transistors across the top of the screen and a column of them down the side?

- A passive matrix screen uses a row of transistors across the top of the screen and a column of them down the side. It sends pulses to each pixel at the intersection of each row and column combination, telling it what to display. An active matrix screen uses a separate transistor for each individual pixel in the display, resulting in higher refresh rates and brighter display quality. Twisted nematic (TN) is the older of the two major technologies for flat-panel displays. While it provides the shortest response time, has high brightness, and draws less power than competing technologies, it suffers from poor quality when viewed from wide angles. In-Plane Switching (IPS) is a newer technology that solves the issue of poor quality at angles other than straight on.

9. Which display is a newer technology that solves the issue of poor quality at angles other than straight on?

   - D) In-Plane Switching (IPS) is a newer technology that solves the issue of poor quality at angles other than straight on. A passive matrix screen uses a row of transistors across the top of the screen and a column of them down the side. It sends pulses to each pixel at the intersection of each row and column combination, telling it what to display. An active matrix screen uses a separate transistor for each individual pixel in the display, resulting in higher refresh rates and brighter display quality. Twisted nematic (TN) is the older of the two major technologies for flat-panel displays. While it provides the shortest response time, has high brightness, and draws less power than competing technologies, it suffers from poor quality when viewed from wide angles.

10. Which of the following lets you quickly connect/disconnect with external peripherals and may also provide extra ports that the notebook PC doesn't normally have?

    - D) With a hot dock, a laptop once put into suspended mode will recognize plug-and-play devices. A docking station essentially allows a laptop computer to be converted to a desktop computer. Laptop and table locks are used to secure mobile devices.

11. In what mode of plug and play must the laptop be turned off and back on for the change to be recognized?

    - C) In cold docking, the laptop must be turned off and back on for the change to be recognized. In warm docking, the laptop must be put in and out of suspended mode for the change to be recognized. In hot docking, the change can be made and is recognized while running normal operations.

12. Which of the following is a class of devices that specializes in tracking your movement?

- A)While many smart watches can also act as fitness monitors, there is a class of devices that specializes in tracking your movement. Fitness monitors read your body temperature, heart rate, and blood pressure. Extended reality is an exciting new field that includes both augmented reality and virtual reality. Today's smartphones are really computers that can make calls, and tablets have been in existence in some form or fashion since the early 1990s. Early on they were proprietary devices that didn't have a lot in common with desktop computers, but increasingly the two form factors have gravitated toward one another.

13. Which of the following uses satellite information to plot the global location of an object and uses that information to plot the route to a second location?

- A) A global positioning system (GPS) uses satellite information to plot the global location of an object and uses that information to plot the route to a second location. Geofencing is the use of GPS to restrict communication to an area. Remote wipe is the cleaning of data from a lost or stolen device. There is no such thing as local wipe.

14. Which interface is the most common port found on mobile devices?

- A) he two most common ports found on mobile devices are micro-USB and mini-USB. Both are small–form-factor implementations of the USB standard, the latest of which is USB 3.1. Thunderbolt ports are most likely to be found on Apple laptops, but they are now showing up on others as well. Serial and PS/2 connecters are rarely found on mobile devices.

15. Which is the most common pin code when selecting discovered Bluetooth devices?

- A) Many external devices will ask for a PIN when you select the external device from the list of discovered devices. In many cases, the PIN is 0000, but you should check the manual of the external device

16. Which of the following is the connection between the mobile device and the radio?

- A) The product release information (PRI) is the connection between the mobile device and the radio. From time to time this may need updating, which, when done, may add features or increase data speed. The preferred roaming list (PRL) is a list of radio frequencies residing in the memory of some kinds of digital phones. International Mobile Equipment Identification (IMEI) is used to identify a physical phone

device, while International Mobile Subscriber Identification (IMSI) is used to identify a Subscriber Identification Module (SIM) card.

17. Which of the following is a process whereby not only does the server verify the credential of the client but the client also verifies the credential of the server?

    - A) Mutual authentication is a process whereby not only does the server verify the credential of the client but the client also verifies the credential of the server. It adds additional security to the process. Single sign-on is a service that allows users to sign in once and have access to all resources. Multifactor authentication makes use of multiple factors of authentication to increase security. Biometrics is the use of physical factors of authentication.

18. Which of the following is the use of physical factors of authentication?

    - D) Mutual authentication is a process whereby not only does the server verify the credential of the client but the client also verifies the credential of the server. It adds additional security to the process. Single sign-on is a service that allows users to sign in once and have access to all resources. Multifactor authentication makes use of multiple factors of authentication to increase security. Biometrics is the use of physical factors of authentication.

4.2   Networking

1. Which the following uses port 110?

    - D) POP3 uses port 110. SSH uses port 22, FTP uses ports 20 and 21, and Telnet uses port 23.

2. Which of the following uses two ports?

    - A) FTP uses ports 20 and 21. POP3 uses port 110, SSH uses port 22, and Telnet uses port 23.

3. Which the following uses port 22?

    - B)SSH uses port 22, POP3 uses port 110, FTP uses ports 20 and 21, and Telnet uses port 23.

4. Which device operates at layer 2?

    - A) Switches operate at layer 2. Routers operate at layer 3. Repeaters and hubs operate at layer 1.

5. Which device operates at layer 1?

    - D. Hubs operate at layer 1. Switches and bridges operate at layer 2. Routers operate at layer 3.

6. Which device operates at layer 2?

   - B. Switches operate at layer 2. Routers operate at layer 3. Hubs and repeaters operate at layer 1.

7. Which of the following is not a private IP address range?

   - B. The class B range is 172.16.0.0–172.31.255.255. The other ranges are correct.

8. Which of the following delivers an upload speed equal to the download speed?

   - A) Symmetric DSL (SDSL) offers an upload equal to the download speed. The other versions all have slower upload speed than download speed.

9. Which of the following is an area where you can place a public server for access by people you might not trust otherwise?

   - B). A demilitarized zone (DMZ) is an area where you can place a public server for access by people you might not trust otherwise. NAT is a service that maps private IP addresses to public IP addresses. The intranet is the internal network that should be protected. The Internet is the untrusted public network.

10. Which of the following operates in the 5.0 GHz range?

    - A)802.11a operates in the 5.0 GHz range. The other standards all operate in the 2.4 GHz range.

11. Which of the following operates at a maximum of 2 MB?

    - D) 802.11a and 802.11g have a maximum rate of 54 MB, 802.11b has a maximum of 11 MB, and 802.11 has a maximum of 2 MB.

12. Which of the following has the largest cell size?

    - C) 802.11g has a distance that is the cell size of 125 ft. The others have a distance of 115 ft.

13. Which type of server resolves IP addresses to hostnames?

    - B) DNS servers resolve IP addresses to hostnames. HTTP servers are web servers. DHCP servers provide automatic IP configurations. SQL is a database server.

14. Which type of server provides automatic IP configurations?

    - C) DHCP servers provide automatic IP configurations. DNS servers resolve IP addresses to hostnames. HTTP servers are web servers. SQL is a database server.

15. Which type of server is a database server?

   - D) A SQL server is a database server. DNS servers resolve IP addresses to hostnames. HTTP servers are web servers. DHCP servers provide automatic IP configurations.

16. Which of the following is a Class B address?

   - The Class B range is 128–191. The class A range is 1–126. The Class C range is 192–223.

17. Which of the following is a Class A address?

   - The Class A range is 1–126. The class B range is 128–191. The Class C range is 192–223.

18. Which of the following is a Class C address?

   - The Class C range is 192–223. The class A range is 1–126. The class B range is 128–191. The 224 range is for multicasting.

19. When personal devices include networking capabilities and can communicate directly with one another, they create which type of network?

   - A personal area network (PAN) is a LAN created by personal devices. A wide area network (WAN) is a collection of two or more LANs, typically connected by routers and dedicated leased lines. Occasionally, a WAN will be referenced as a metropolitan area network (MAN) when it is confined to a certain geographic area, such as a university campus or city. Wireless mesh networks (WMN) are a form of an ad hoc WLAN that often consist of mesh clients, mesh routers, and gateways.

20. Which of the following is a collection of two or more LANs, typically connected by routers and dedicated leased lines?

   - Metropolitan area network (MAN) is the term occasionally used for a WAN that is confined to a certain geographic area, such as a university campus or city. A personal area network (PAN) is a LAN created by personal devices. A wide area network (WAN) is a collection of two or more LANs, typically connected by routers and dedicated leased lines. Wireless mesh networks (WMN) are a form of an ad hoc WLAN that often consist of mesh clients, mesh routers, and gateways.

21. Which of the following is a form of ad hoc WLAN?

   - Wireless mesh networks (WMN) are a form of an ad hoc WLAN that often consist of mesh clients, mesh routers, and gateways. A personal area network (PAN) is a LAN created by personal devices.

A wide area network (WAN) is a collection of two or more LANs, typically connected by routers and dedicated leased lines. Occasionally, a WAN will be referenced as a metropolitan area network (MAN) when it is confined to a certain geographic area, such as a university campus or city.

22. Which of the following is used to attach media connectors to the ends of cables?

- Wire crimpers look like pliers but are used to attach media connectors to the ends of cables. A cable stripper is used to remove the outer covering of the cable to get to the wire pairs within. A multimeter combines a number of tools into one. There can be slight variations, but a multimeter always includes a voltmeter, an ohmmeter, and an ammeter (and is sometimes called VOM as an acronym). A toner probe has two parts: the tone generator (called the toner) and the tone locator (called the probe). The toner sends the tone, and at the other end of the cable, the probe receives the toner's signal. This tool makes it easier to find the beginning and end of a cable.

23. Which of the following includes a voltmeter, an ohmmeter, and an ammeter?

- A multimeter combines a number of tools into one. There can be slight variations, but a multimeter always includes a voltmeter, an ohmmeter, and an ammeter (and is sometimes called VOM as an acronym). Wire crimpers look like pliers but are used to attach media connectors to the ends of cables. A cable stripper is used to remove the outer covering of the cable to get to the wire pairs within. A toner probe has two parts: the tone generator (called the toner) and the tone locator (called the probe). The toner sends the tone, and at the other end of the cable, the probe receives the toner's signal. This tool makes it easier to find the beginning and end of a cable.

24. Which of the following makes it easier to find the beginning and end of a cable?

- A toner probe has two parts: the tone generator (called the toner) and the tone locator (called the probe). The toner sends the tone, and at the other end of the cable, the probe receives the toner's signal. This tool makes it easier to find the beginning and end of a cable. Wire crimpers look like pliers but are used to attach media connectors to the ends of cables. A cable stripper is used to remove the outer covering of the cable to get to the wire pairs within. A multimeter combines a number of tools into one. There can be slight variations, but a multimeter always includes a voltmeter, an ohmmeter, and an ammeter (and is sometimes called VOM as an acronym).

4.3   Hardware

1. Which cable type comes in two varieties: unshielded and shielded?

   - C) Twisted pair is commonly used in office settings to connect workstations to hubs or switches. It comes in two varieties: unshielded (UTP) and shielded (STP). Fiber optic, serial, and coaxial do not come in shielded and unshielded versions.

2. Which cable type transmits data at speeds up to 100 Mbps and was used with Fast Ethernet (operating at 100 Mbps) with a transmission range of 100 meters?

   - B) Cat 5 transmits data at speeds up to 100 Mbps and was used with Fast Ethernet (operating at 100 Mbps) with a transmission range of 100 meters. It contains four twisted pairs of copper wire to give the most protection. Although it had its share of popularity (it's used primarily for 10/100 Ethernet networking), it is now an outdated standard. Newer implementations use the 5e standard. Cat 4 transmits at 16 Mbps, and Cat 6 transmits at 1 Gbps.

3. Which cable type has a glass core within a rubber outer coating?

   - A) Fiber-optic cabling is the most expensive type of those discussed for this exam. Although it's an excellent medium, it's often not used because of the cost of implementing it. It has a glass core within a rubber outer coating and uses beams of light rather than electrical signals to relay data. None of the other options uses glass in its construction.

4. Which connector is used for telephone cord?

   - A) An RJ-11 is a standard connector for a telephone line and is used to connect a computer modem to a phone line. It looks much like an RJ-45 but is noticeably smaller. The RJ-45 is used for networking. RS 232 is a serial connector. BNC is a coaxial connector.

5. Which standard has been commonly used in computer serial ports?

   - C) The RS-232 standard had been commonly used in computer serial ports. A serial cable (and port) uses only one wire to carry data in each direction; all the rest are wires for signaling and traffic control. An RJ-11 is a standard connector for a telephone line and is used to connect a computer modem to a phone line. It looks much like an RJ-45 but is noticeably smaller. The RJ-45 is used for networking.

6. Which connectors are sometimes used in the place of RCA connectors for video electronics?

- D) Bayonet Neill–Concelman (BNC) connectors are sometimes used in the place of RCA connectors for video electronics, so you may encounter these connectors, especially when video equipment connects to a PC. In many cases, you may be required to purchase an adapter to convert this to another form of connection because it is rare to find one on the PC. An RJ-11 is a standard connector for a telephone line and is used to connect a computer modem to a phone line. It looks much like an RJ-45 but is noticeably smaller. The RJ45 is used for networking. RS-232 is a serial connector.

7. Which RAM type is used in laptops?

   - B)Portable computers (notebooks and subnotebooks) require smaller sticks of RAM because of their smaller size. One of the two types is small outline DIMM (SODIMM), which can have 72, 144, or 200 pins. DIMM is a full-size RAM type. Rambus is a type of RAM but not used in laptops, and BNC is a connector for coaxial cabling.

8. Which RAM type allows for two memory accesses for each rising and falling clock?

   - D) DDR SDRAM is Double Data Rate 2 (DDR2). This allows for two memory accesses for each rising and falling clock and effectively doubles the speed of DDR. DDR2-667 chips work with speeds at 667 MHz and are also referred to as PC2-5300 modules. DDR3 is the higher-speed successor to DDR and DDR2. Portable computers (notebooks and subnotebooks) require smaller sticks of RAM because of their smaller size. One of the two types is small outline DIMM (SODIMM), which can have 72, 144, or 200 pins.

9. Which RAM type is not compatible with any earlier type of random-access memory?

   - B) DDR4 SDRAM is an abbreviation for double data rate fourth-generation synchronous dynamic random-access memory. DDR4 is not compatible with any earlier type of random-access memory (RAM). The DDR4 standard allows for DIMMs of up to 64 GB in capacity, compared to DDR3's maximum of 16 GB per DIMM. DDR3 and DDR2 are backward compatible, and there is no DDR5

10. Which of the following is a rewritable optical disc?

    - B) Compact Disc-ReWritable (CD-RW) media is a rewritable optical disc. A CD-RW drive requires more sensitive laser optics. It can write data to the disc but also has the ability to erase that data and write more data to the disc. CD, DVD, and CD-ROM are all read-only.

11. Which of the following is a specification for internally mounted computer expansion cards and associated connectors that replaces the mSATA?

- A) M.2, formerly known as the Next Generation Form Factor (NGFF), is a specification for internally mounted computer expansion cards and associated connectors. It replaces the mSATA standard. M.2 modules are rectangular, with an edge connector on one side, and a semicircular mounting hole at the center of the opposite edge. Non-Volatile Memory Host Controller Interface Specification (NVME) is an open logical device interface specification for accessing nonvolatile storage media attached via a PCI Express (PCIe) bus. Serial ATA and serial ATA 2.5 are computer bus interfaces that connects host bus adapters to mass storage devices such as hard disk drives, optical drives, and solid-state drives

12. At what speed will latency on a magnetic drive decrease to about 3 ms?

- C) At 10,000 rpm, the latency will decrease to about 3 ms. Data transfer rates also generally go up with a higher rotational speed but are influenced by the density of the disk (the number of tracks and sectors present in a given area). Latency at 5400 rpm will be 5.56 ms. At 7200 it will be 4.17, and at 15000 it will drop to 2.

13. Laptops and other portable devices utilize which expansion card?

- A) Laptops and other portable devices utilize an expansion card called the miniPCI. It has the same functionality as the PCI but has a much smaller form factor. PCI and PCIe are used in desktops. SATA is a drive connector.

14. Which of the following is a standard firmware interface for PCs, designed to replace BIOS?

- A) Unified Extensible Firmware Interface (UEFI) is a standard firmware interface for PCs, designed to replace BIOS. NVRAM is RAM that retains its data during a reboot. CMOS is a battery type found on motherboards, and CHS is a drive geometry concept

15. Which of the following is memory that does not lose its content when power is lost to the machine?

- B) NVRAM is memory that does not lose its content when power is lost to the machine. Unified Extensible Firmware Interface (UEFI) is a standard firmware interface for PCs, designed to replace BIOS. CMOS is a battery type found on motherboards, and CHS is a drive geometry concept.

16. Which of the following devices allows you to plug multiple PCs (usually servers) into the device and to switch easily back and forth from system to system using the same mouse, monitor, and keyboard?

- A) A keyboard, video, and mouse (KVM) device allows you to plug multiple PCs (usually servers) into the device and to switch easily back and forth from system to system using the same mouse, monitor, and keyboard. The KVM is actually a switch that all the systems plug into. There is usually no software to install. Just turn off all the systems, plug them all into the switch and turn them back on; then you can switch from one to another using the same keyboard, monitor, and mouse device connected to the KVM switch. CMOS is a battery type found on motherboards, and CHS is a drive geometry concept. NVRAM is memory that does not lose its content when power is lost to the machine.

17. Which of the following is a description of light output?

    - B) When discussing bulbs for projectors, brightness is a description of light output, which is measured in lumens (not watts). Ensure that you are purchasing the correct bulb for the projector and maximize the life of the bulb by turning the projector off when not in use. A keyboard, video, and mouse (KVM) device allows you to plug multiple PCs (usually servers) into the device and to switch easily back and forth from system to system using the same mouse, monitor, and keyboard. Contrast is the relationship between dark and light. CHS is a drive geometry concept.

18. Which of the following is a standard managed by the ISO and uses tags that are embedded in the devices?

    - C) NFC components include an initiator and a target; the initiator actively generates an RF field that can power a passive target. This enables NFC targets to take simple form factors such as tags, stickers, key fobs, or cards that do not require batteries. When discussing bulbs for projectors, brightness is a description of light output, which is measured in lumens (not watts). Ensure that you are purchasing the correct bulb for the projector and maximize the life of the bulb by turning the projector off when not in use. A keyboard, video, and mouse (KVM) device allows you to plug multiple PCs (usually servers) into the device and to switch easily back and forth from system to system using the same mouse, monitor, and keyboard. CHS is a drive geometry concept

19. In 2004, the ATX 12V 2.0 (now 2.03) standard was passed, changing the main connector from 20 pins to how many?

    - C) In 2004, the ATX 12V 2.0 (now 2.03) standard was passed, changing the main connector from 20 pins to 24. The additional pins provide +3.3V, +5V, and +12V (the fourth pin is a ground) for use by PCIe cards. When a 24-pin connector is used, there is no need for the optional four- or six-pin auxiliary power connectors.

20. When using the AT power connector, the power cable coming from the power supply will have two separate connectors, labeled what?

   - When using the AT power connector, the power cable coming from the power supply will have two separate connectors, labeled P8 and P9. When you are attaching the two parts to the motherboard, the black wires on one should be next to the black wires on the other for proper function

21. The SATA power connector has how many pins?

   - C)The SATA power connector consists of 15 pins, with 3 pins designated for 3.3V, 5V, and 12V and with each pin carrying 1.5 amps. This results in a total draw of 4.95 watts + 7.5 watts + 18 watts, or about 30 watts

22. Which of the following is a desktop computer system?

   - C) A thick client has the applications installed locally and will need to have sufficient resources to support the applications. A thin client only sends commands and displays output with the application on the server. Network attached storage is a storage network that is IP based, while Storage Area Networks use a storage area protocol

23. Which of the following is a PC that has all the capabilities of a standard PC?

   - C) When discussing thin and thick clients, you should understand that a thick client is a PC that has all the capabilities of a standard PC. It runs all applications locally from its own hard drive. A thin client is one that has minimal capabilities and runs the applications (and perhaps even the operating system itself) from a remote server. There is no standard client or thin host.

24. The amount of RAM that is required in a virtualization workstation depends on which of the following?

   - C) Number of VMs

25. Which IP setting is optional for network connectivity on a thin client?

   - D) proxy server address is optional.

26. Which of the following needs the most resources?

   - B) A thick client is a standard PC. When discussing thin and thick clients, you should understand that a thick client is a PC that has all the capabilities of a standard PC. It runs all applications locally from its own hard drive. A thin client is one that has minimal capabilities and runs the applications (and perhaps even the operating system itself) from a remote server. There is no medium client or stationary client

27. How is accountability ensured?

   - C) Ensure accountability by using no shared accounts. Each user should have a unique username/password combination. Audit trails should always be created.

28. What software controls how the printer processes the print job?

   - A) When you install a printer driver for the printer you are using, it allows the computer to print to that printer correctly (assuming you have the correct interface configured between the computer and printer). Also, keep in mind that drivers are specific to the operating system, so you need to select the one that is both for the correct printer and for the correct operating system.

29. What printer component turns the printed sheet over so it can be run back through the printer and allow printing on both sides?

   - B) An optional component that can be added to printers (usually laser but also inkjet) is a duplexer. This can be an optional assembly added to the printer, or built into it, but the sole purpose of duplexing is to turn the printed sheet over so it can be run back through the printer and allow printing on both sides

30. Which of the following refers to how the printed matter is laid out on the page?

   - C) .The orientation of a document refers to how the printed matter is laid out on the page. In the landscape orientation, the printing is written across the paper turned on its long side, while in portrait the paper is turned up vertically and printed top to bottom. The driver is the software that talks between the printer and the operating system. Duplexing makes it possible to print on both sides. To collate is to create multiple copies with all sets in correct page order

31. Which of the following feeds through the printer using a system of sprockets and tractors?

   - A)Continuous-feed paper feeds through the printer using a system of sprockets and tractors. Sheet-fed printers accept plain paper in a paper tray. Dot matrix is continuous feed; everything else is sheet fed

32. Which of the following should not be used more than once?

   - B) Never reuse paper in a laser printer that has been through the printer once. Although it may look blank, you're repeating the charging and fusing process on a piece of paper that most likely has something already on it.

33. Which of the following is a large circuit board that acts as the motherboard for the printer?

- A) This is a large circuit board that acts as the motherboard for the printer. It contains the processor and RAM to convert data coming in from the computer into a picture of a page to be printed. The imaging drum is the drum where the toner is placed on the correctly charged area. The toner cartridge is the container holding the toner. The maintenance kit contains items that should be changed periodically like rollers

4.4 Virtualization and Cloud Computing

1. Which of the following involves the vendor providing the entire solution?

- Software as a service (SaaS) involves the vendor providing the entire solution. This includes the operating system, the infrastructure software, and the application. Infrastructure as a service (IaaS) provides only the hardware platform to the customer. Platform as a service (PaaS) provides a development environment. Security Information and Event Management (SIEM) is a system that aggregates all log files and analyzes them in real time for attacks.

2. When a company pays another company to host and manage a cloud environment, it is called what?

- B) When a company pays another company to host and manage a cloud environment, it is called a public cloud solution. If the company hosts this environment itself, it is a private cloud solution. A hybrid cloud solution is one in which both public and private clouds are part of the solution. A community cloud is one in which multiple entities use the cloud.

3. Which of the following is the ability to add resources as needed on the fly and release those resources when they are no longer required?

- B) One of the advantages of a cloud environment is the ability to add resources as needed on the fly and release those resources when they are no longer required. This makes for more efficient use of resources, placing them where needed at any particular point in time. These include CPU and memory resources. This is called rapid elasticity because it occurs automatically according to the rules for resource sharing that have been deployed. On-demand refers to the ability of the customer to add resources as needed. Virtual sharing and stretched resources are not terms used when discussing the cloud.

4. In which VDI model are all desktop instances stored in a single server, requiring significant processing power on the server?

- A) There are three models for implementing VDI: Centralized model: All desktop instances are stored in a single server, requiring significant processing power on the server. Hosted model: Desktops are maintained by a service provider. This model eliminates capital cost and is instead subject to operation cost. Remote virtual desktops model: An image is copied to the local machine, making a constant network connection unnecessary. There is no local model.

5. Which of the following involves the vendor providing the hardware platform or data center and the software running on the platform?

   - A) PaaS (Platform as a Service)

6. What is the benefit derived from using hardware-assisted virtualization?

   - A) Better performance

7. Which of the following is the software that allows the VMs to exist?

   - B) Hypervisor

8. Which hypervisor type runs directly on the host's hardware?

   - B) Type I

9. Which of the following is an example of a Type II hypervisor?

   - A) Oracle VirtualBox

10. Which of the following hypervisors runs within a conventional operating system?

    - Type I

4.5   Hardware and Network Troubleshooting

1. Which of the following is the final step in the CompTIA troubleshooting method?

   - B) Document findings, actions, and outcomes.

2. Which of the following is the first step in the CompTIA troubleshooting method?

   - (D) Identify the problem

3. What is the most common reason for an unexpected reboot?

   - A. One common reason for shutdowns is overheating. Often when that is the case, however, the system reboots itself rather than just shutting down.

4. Which of the following is typically not a cause of system lockups?

   • D. A bad NIC driver would cause the NIC not to work but would not cause a system lockup.

5. What are proprietary screen crashes called in Windows?

   • B. Once a regular occurrence when working with Windows, blue screens (also known as the blue screen of death) have become much less frequent.

6. Which operating system uses the Pinwheel of Death as a proprietary screen crash?

   • A. While Microsoft users have the BSOD to deal with, Apple users have also come to have the same negative feelings about the Pinwheel of Death. This is a multicolored pinwheel mouse pointer.

7. What are the small dots on the screen that are filled with a color?

   • A. Pixels are the small dots on the screen that are filled with a color; as a group they present the image you see on the screen.

8. What are visual anomalies that appear on the screen called?

   • B. Artifacts are visual anomalies that appear on the screen. They might be pieces of images left over from a previous image or a "tear in the image" (it looks like the image is divided into two parts and the parts don't line up).

9. What is the light in the device that powers the LCD screen?

   • A. The backlight is the light in the device that powers the LCD screen. It can go bad over time and need to be replaced, and it can also be held captive by the inverter. The inverter takes the DC power the laptop is providing and boosts it up to AC to run the backlight. If the inverter goes bad, you can replace it on most models (it's cheaper than the backlight).

10. Which of the following is a user interface feature designed by HTC?

   • B. Touch flow, or TouchFLO, is a user interface feature designed by HTC. It is used by dragging your finger up and down or left and right to access common tasks on the screen. This movement is akin to scrolling the screen up and down or scrolling the screen left and right.

11. Which of the following indicates that the fuser is not fusing the toner properly on the paper?

- B. With laser printers, streaks usually indicate that the fuser is not fusing the toner properly on the paper. It could also be that the incorrect paper is being used. In laser printers, you can sometimes tell the printer that you are using a heavier paper. For dot- matrix, you can adjust the platen for thicker paper.

12. Which of the following indicates that the toner cartridge is just about empty?

- C. In laser printers, faded output usually indicates that the toner cartridge is just about empty. You can usually remove it, shake it, and replace it and then get a bit more life out of it before it is completely empty, but it is a signal that you are near the end.

13. If you can ping resources by IP address but not by name, functional.

- B) DNS . You may be able to ping the entire network using IP addresses, but most access is done by name, not IP address. If you can't ping resources by name, DNS is not functional, meaning either the DNS server is down or the local machine is not configured with the correct IP address of the DNS server.

14. Which of the following should be set to the IP address of the router interface connecting to the local network?

- C) If the computer cannot connect to the default gateway, it will be confined to communicating with devices on the local network. This IP address should be that of the router interface connecting to the local network.

5 Mike Meyers

5.1 The Visible Computer

1. Which version of Windows introduced the Metro UI?

- B)Microsoft introduced Metro UI with Windows 8.

2. Which Windows 8 feature did Microsoft not include in Windows 10?

- D) Microsoft did not include the Charms bar in Windows 10. Bye!

3. What macOS feature is essentially multiple Desktops?

- D) Spaces is the term Apple uses for multiple Desktops in macOS.

4. What KDE feature is essentially the Start button?

- Kickoff functions like a Start button for KDE desktops.

5. The user Mike has downloaded files with his Web browser. Where will they be stored by default?

   - C:\$Users\Mike\$ Downloads

6. 32-bit programs are installed into which folder by default in a 64-bit edition of Windows?

   - By default, 32-bit applications install into the $C:\ProgramFiles(x86)$ folder.

7. Which macOS feature is functionally equivalent to Windows File Explorer?

   - A) Finder is the equivalent of File Explorer.

8. Which of the following paths would open Administrative Tools in Windows 8.1?

   - B) To open Administrative Tools, right-click the Start button and select Administrative Tools. Easy!

9. What feature of macOS is the equivalent of the command-line interface in Windows

   - C) Terminal is the equivalent of the Windows command-line interface.

10. What Windows app in Windows 10 combines many utilities into a unified tool?

    - C)The Settings app in Windows 10 offers many utilities in a unified interface.

5.2   CPUs

1. What do registers provide for the CPU?

   - B) The CPU uses registers for temporary storage of internal commands and data.

2. C) What function does the external data bus have in the PC?

   - The external data bus provides a channel for the flow of data and commands between the CPU and RAM.

3. What is the function of the address bus in the PC?

   - A) The address bus enables the CPU to communicate with the memory controller chip.

4. Which of the following terms are measures of CPU speed?

- A) Megahertz and gigahertz

5. Which CPU feature enables the microprocessor to support running multiple operating systems at the same time?

    - D) Virtualization support

6. Into which socket could you place an Intel Core i5?

    - B) Socket LGA 1151

7. Which feature enables a single-core CPU to function like two CPUs?

    - A) Hyper-Threading

8. What steps do you need to take to install a Core i3 CPU into an FM2+ motherboard?

    - D) Take all of the steps you want to take because it's not going to work

9. A client calls to complain that his computer starts up, but crasheswhen Windows starts to load. After a brief set of questions, you findout that his nephew upgraded his RAM for him over the weekend andcouldn't get the computer to work right afterward. What could be theproblem?

    - A) Most likely, the nephew disconnected the CPU fan to get at the RAM slots and simply forgot to plug it back in.

10. Darren has installed a new CPU in a client's computer, but nothinghappens when he pushes the power button on the case. The LED onthe motherboard is lit up, so he knows the system has power. Whatcould the problem be?

    - The best answer here is that he forgot the thermal paste, thoughyou can also make an argument for a disconnected fan.

5.3   RAM

1. Steve adds a second 8-GB 288-pin DIMM to his PC, which should bring the total RAM in the system up to 16 GB. The PC has an Intel Core i7 4-GHz processor and four 288-pin DIMM slots on the motherboard. When he turns on the PC, however, only 8 GB of RAM shows up in Windows Settings app. Which of the following is most likely to be the problem?

    - A) Steve failed to seat the RAM properly.

2. Scott wants to add 8 GB of PC3-12800 DDR3 to an aging but still useful desktop system. The system has a 200-MHz motherboard and currently has 4 GB of non-ECC DDR3 RAM in the system. What else does he need to know before installing?

- D) If the system can handle that much RAM.

3. What is the primary reason that DDR4 RAM is faster than DDR3 RAM?

    - The input/output speed of the DDR4 RAM is faster.

4. What is the term for the delay in the RAM's response to a request from the MCC?

    - C) Latency (MCC Memory Controller Chip)

5. How does an NMI (Non-Maskable Interrupt) manifest on a Windows system?

    - A) Blue Screen of Death.

6. Silas has an AMD-based motherboard with two sticks of DDR3 RAM installed in two of the three RAM slots, for a total of 8 GB of system memory. When he runs CPU-Z to test the system, he notices that the software claims he's running single-channel memory. What could be the problem? (Select the best answer.)

    - D)He needs to move one of the installed sticks to a different slot to activate dual-channel memory.

7. Which of the following Control Panel applets will display the amount of RAM in your PC?

    - A) System

8. What is the best way to determine the total capacity and specific type of RAM your system can handle?

    - A) Check the motherboard book.

9. Gregor installed a third stick of known good RAM into his Core i7 system, bringing the total amount of RAM up to 12 GB. Within a fewdays, though, he started having random lockups and reboots, especially when doing memory-intensive tasks such as gaming. What is most likely the problem?

    - Gregor installed RAM that didn't match the speed or quality of the RAM in the system.

10. Cindy installs a second stick of DDR4 RAM into her Core i5 system, bringing the total system memory up to 16 GB. Within a short period of time, though, she begins experiencing Blue Screens of Death. What could the problem be?

    - She installed faulty RAM.

5.4 Firmware

1. What does BIOS provide for the computer? (Choose the best answer.)

   - B) BIOS provides the programming that enables the CPU to communicate with other hardware.

2. What is the correct boot sequence for an older BIOS-based PC? A. CPU,

   - D) Power good, CPU, POST, boot loader, operating system

3. Jill decided to add a second hard drive to her computer. She thinks she has it physically installed correctly, but it doesn't show up in Windows. Which of the following options will most likely lead Jill where she needs to go to resolve the issue?

   - B) Jill should reboot the computer and watch for instructions to enter the CMOS setup utility (for example, a message may say to press the DELETE key). She should do what it says to go into CMOS setup

4. Henry bought a new card for capturing television on his computer. When he finished going through the packaging, though, he found no driver disc, only an application disc for setting up the TV capture software. After installing the card and software, it all works flawlessly. What's the most likely explanation?

   - B) The device has an option ROM that loads BIOS, so there's no need for a driver disc. need for a driver disc.

5. Which of the following most accurately describes the relationship between BIOS and hardware?

   - A) All hardware needs BIOS.

6. After a sudden power outage, Samson's PC rebooted, but nothing appeared on the screen. The PC just beeps at him, over and over and over. What's most likely the problem?

   - A) The power outage toasted his RAM.

7. Davos finds that a disgruntled former employee decided to sabotage her computer when she left by putting a password in CMOS that stops the computer from booting. What can Davos do to solve this problem?

   - C) Davos should find the CLRTC jumper on the motherboard. Then he can boot the computer with a shunt on the jumper to clear the CMOS information.

8. Richard over in the sales department went wild in CMOS and made a bunch of changes that he thought would optimize his PC. Now most of his PC doesn't work. The computer powers up, but he can only get to CMOS, not into Windows. Which of the following tech call answers would most likely get him up and running again?

- D) Please don't hand Richard a screwdriver! Having him load Optimized Default settings will most likely do the trick.

9. Jill boots an older Pentium system that has been the cause of several user complaints at the office. The system powers up and starts to run through POST, but then stops. The screen displays a "CMOS configuration mismatch" error. Of the following list, what is the most likely cause of this error?

- A) CMOS battery is likely dying.

10. Where does Windows store device drivers?

- C) Registry

5.5   Motherboards

1. Which of the following statements about the expansion bus is true?

- B)The expansion bus crystal sets the speed for the expansion bus.

2. What does a black down arrow next to a device in Device Manager indicate?

- D)The device has been disabled.

3. Which variation of the PCI bus was specifically designed for laptops?

- C) Mini-PCI

4. Which of the following form factors dominates the PC industry?

- B) ATX

5. Amanda bought a new system that, right in the middle of an important presentation, gave her a Blue Screen of Death. Now her system won't boot at all, not even to CMOS. After extensive troubleshooting, she determined that the motherboard was at fault and replaced it. Now the system runs fine. What was the most likely cause of the problem?

- A) Although all of the answers are plausible, the best answer here is that her system suffered burn-in failure.

6. Martin bought a new motherboard to replace his older ATX motherboard. As he left the shop, the tech on duty called after him, "Check your standoffs!" What could the tech have meant?

- C. Standoffs are the metal connectors that attach the motherboard to the case.

7. Solon has a very buggy computer that keeps locking up at odd moments and rebooting spontaneously. He suspects the motherboard. How should he test it?

   - Check settings, verify good components, replace components, and document all testing.

8. When Jane proudly displayed her new motherboard, the senior tech scratched his beard and asked, "What kind of northbridge does it have?" What could he possibly be asking about?

   - C. The tech is using older terminology to refer to the chips—the chipset—that help the CPU communicate with devices.

9. What companies dominate the chipset market? (Select two.)

   - A, C) AMD, NVIDIA

10. If Windows recognizes a device, where will it appear?

   - Device Manager

5.6 Motherboards

1.

6 CompTIA A+ Core 1 Exam Cram David L. Prowse

6.1 Laptop Part I

1. What kinds of hard drives are used by laptops? (Select all that apply.)

   - A, B and C. Solid state drives (SSDs), M.2 drives, and mag- netic disk drives are all found on laptops. Which drive the lap- top uses will depend on its age and whether or not it has been upgraded. DVD-ROM drives are not hard drives, they are opti- cal drives, and as of 2015 or so, are not commonly found on laptops.

2. What is the module format for a stick of SODIMM DDR4 RAM?

   - C. DDR4 SODIMM modules have 260 pins. DDR (known as DDR1) and DDR2 are 200-pin. DDR3 is 204-pin. 1/8 inch is the size asso- ciated with smaller hard drives used in some lap- tops.

3. You just added a second memory module to a laptop. Howev- er, after rebooting the system, the OS reports the same amount of memory as before. What should you do next?

- D. The next step you should take is to reseat the memory. SODIMMs can be a bit tricky to install. They must be firmly installed, but you don't want to press too hard and damage any components. If the laptop worked fine before the upgrade, you shouldn't have to replace the modules or the motherboard. Windows Update will not find additional RAM.

4. Which of the following are ways that a laptop can communi- cate with other computers? (Select all that apply.)

- A, B, and D. Some of the methods that laptops use to commu- nicate with other computers include: Bluetooth, WLAN, and cellular WAN wireless connections, plus wired connections like Ethernet (RJ45) and for older laptops, dial-up (RJ11). The DC jack is the input on the laptop that accepts power from the AC adapter.

5. Which of the following are possible reasons that a laptop's keyboard might fail completely? (Select thetwo best answers.)

- C) The user spilled coffee on the laptop. D) The keyboard was dis- abled in the Device Manager.B and C. A laptop's keyboard could fail due to a disconnected or loose keyboard ribbon cable. It could also fail if a user spilled coffee on the laptop, by being dropped on the ground, and so on. One stuck key will not cause the entire keyboard tofail, and on most laptops, the keyboard cannot be disabled in the Device Manager. It can be uninstalled, but not disabled.

6. A user doesn't see anything on his laptop's screen. He tries to use AC power and thinks that the laptop is not receiving any. Which of the following are two possible reasons for this? (S- elect the two best answers.)

- A and B. An incorrect adapter will usually not power a laptop. The adapter used must be exact. And of course, if the laptop is not plugged in properly to the adapter, it won't get power. Windows doesn't play into this scenario. And if the battery was dead, it could cause the laptop to not power up, but only if the AC adapter was also disconnected; the scenario states that the user is trying to use AC power.

7. One of your customers reports that she walked away from her laptop for 30 minutes. When she returned, the display was very dim. She increased the brightness setting and moved the mouse but to no effect. What should you do first?

- D. It could be that the laptop is now on battery power, which is usually set to a dimmer display and shorter sleep configura- tion. This indicates that the laptop is not getting AC power from the AC outlet for some reason. The battery power setting is the first thing you should check; afterward, start trou- bleshooting the AC

adapter, cable, AC outlet, and so on. It's too early to try replacing the display; try not to replace some- thing until you have ruled out all other possibilities. A dim screen is not caused by OS corruption. No need to plug in an external monitor; you know the video adapter is working, it's just dim.

8. Which are the most common laptop hard drive form factors? (Select two.)

   - B and D. The bulk of the hard drives in laptops are 2.5 inches wide, though ultra-small laptops and other small portable de- vices might use a hard drive as small as 1.8 inches. 5.1 and 7.1 refer to speaker surround sound systems, not hard drive form factors.

9. You are helping a customer with a laptop issue. The customer said that two days ago the laptop was accidentally dropped while it was charging. You observe that the laptop will not turn on and that it is connected to the correct power adapter. Which of the following is the most likely cause?

   - . D. The DC jack was probably damaged when the laptop was dropped. That's because it was plugged in (charging) and itprob- ably fell on the plug that connects to the DC jack (which is easily damaged on many laptops by the way). The customer probably used the laptop until the battery became discharged before noticing that the laptop wouldn't take a charge anymore —that's why it won't turn on at all. So the battery is probably not the issue. A power adapter can be damaged, but the DC-in jack is more easily damaged. The hard drive and the BIOS nor- mally will not affect whether the laptop will turn on.

6.2   Laptop Part II

1. Which kind of video technology do most laptop LCDs use?

   - A. TFT active-matrix displays are the most common in laptops that use LCDs. Passive-matrixscreens have been discontinued, but you might see an older laptop that utilizes this technology.OLED tech- nology is a newer and different technology that is not based on TFT displays, but instead uses emissive display technology, meaning that each dot on the screen is illuminated by ase parate diode. OLED displays can however bepassive-matrix or active-matrix controlled. The MAC ID is the hexadecimal address associated with a network adapter, such as a Wi-Fi adapter or network card.

2. Which of the following uses an organic compound that emits light?

   - C. OLED (organic light emitting diode) display suse an organic com- pound or film that emits light.TFT active-matrix implies LCD, and neither of them use organic compounds the way OLED does.In-plane

switching (IPS) is a type of LCD technology that increases the available viewing angle compared to older technologies such as twisted nematic (TN) matrix LCDs. However, IPS is generally considered inferior to OLED screens when it comes to brightness and contrast ratio when viewed from an angle. LED screens use a film and diodes, but not organically in the way that OLED does, and not at such a small size.

3. Which of the following are two possible reasons why a laptop's LCD suddenly went blank with no user intervention? (Select the two best answers.)

- A and C. A damaged inverter or burned-out bulb could cause a laptop's display to go blank. You can verify whether the LCD is still getting a signal by shining a flashlight at the screen. A damaged LCD usually works to a certain extent and will either be cracked, have areas of Windows missing, or show other signs of damage. An incorrect resolution setting can indeed make the screen suddenly go blank (or look garbled), but that scenario will most likely occur only if the user has changed the resolution setting—the answer specifies with no user intervention.

4. Which of the following allows us to access a WLAN?

- E. A Wi-Fi card, also known as a Wi-Fi network adapter, allows us to connect to a WLAN (wireless local area network) which is essentially another name for a Wi-Fi network. LED is a type of display. A webcam is used to communicate visually and audibly with others, or to record oneself. A digitizer is the device that converts tapped or written impulses on a screen into digital information that the operating system can use. A stylus is a writing device used with a digitizer or touchscreen.

5. Which of the following keys should you press to enable a secondary display on a laptop? (Select the two best answers.)

- A and D. To enable a secondary, or external, display on a laptop you would use the Fn key (called the function key) and a special function key, for example F3 or F4, whichever one that corresponds to screen switching. It's this combination of keys that allows you to make use of displays plugged into HDMI or other ports on the laptop. The caps lock key enables a user to type in all uppercase letters. The number lock key (if available) turns on the numeric keypad (if the laptop has one). The insert key is often used by programs such as word processors in one of two modes: overtype; where anything that is typed is written over any existing text; and insert mode, where typed characters force the existing text over.

6. When a user types, a laptop's screen displays letters and numbers instead of only letters. What should you check first?

- Num Lock key

7. You are required to install an anti-theft solution for a customer's laptop. Which of the following should you perform?

   - B. Install a cable lock to increase the security of a laptop and decrease the chances of theft. Docking stations and port replicators offer increased functionality for a laptop but do not increase security; the laptop can be easily disconnected from them. Installing Windows is not an anti-theft solution, nor any type of security precaution. Configuring a password in the BIOS/UEFI is a good security practice, but it will not help avoid theft. However, if the laptop is stolen, a user password (and administrator password) that is configured in the BIOS can help prevent a person

8. You are helping a project manager with a presentation using a laptop which feeds video to a projector. During your tests, the projector's image begins to flicker. The laptop's display does not have any problems. You attempt to change the resolution on the laptop, but the issue continues. Which of the following should you do next? A.

   - B. Check the connectivity of the cable. If it is flickering, chances are that the cable is loose, or the cable's quality is lacking. Screen flicker is more common with VGA cables, but it can happen with just about any connection. Remember, always check the basic stuff first: connectivity, power, and so on. It is unlikely that the projector settings will make a difference based on this particular problem. You cannot change the aspect ratio by itself on most laptops, however, when you change the resolution (which was already done in the question) you might be changing the aspect ratio as well, depending on the resolution selected. If the power cable was loose or damaged, it would probably result in more than just screen flicker; the projector might power off and power back on, which would prevent the image from being displayed for at least several seconds while the projector powers back up. Great job so far! Two chapters down!

9. Which of the following is not a mobile device?

   - C. The desktop PC is not a mobile device. It is a stationary computer that is meant to stay at a person's desk. Tablets, smartphones, and e-readers are all examples of mobile devices.

10. Which type of memory do most mobile devices store long-term data to?

    - D. Most mobile devices store their long-term data to solid-state flash memory. They do not use SATA as the method of con- nectivity. LPDDR4 is a common type of RAM used in mobile devices for short-term storage.

11. You have been tasked with connecting a wireless earpiece to a smartphone. Which technology would you most likely use?

- D. When connecting an earpiece (those little cricket-looking devices) to a smartphone, you would most likely use Bluetooth —just remember that most of them have a 30-foot range (10 meters). Wi-Fi is less likely to be used; it is more likely to be used to connect the smartphone to the LAN and ultimately to the Internet. NFC is used to transmit data between mobile de- vices in close proximity to each other. 3.5 mm refers to the au-dio port on a mobile device. It is quite possible that a user will utilize a wired headset, but the question focuses on wireless.

12. You have been tasked with setting up a device for a salesper- son's vehicle. It should be able to display maps and give direc- tions to the person while driving. Which of the following de- vices would perform these tasks? (Select the two best answers.)

- A and C. A standalone GPS device or a smartphone (equipped with a GPS app) would do the job here. Both can display maps and give directions to a person while driving. The other de- vices are not designed to function in this manner.

13. Which type of charging connector would you find on an iPad?

(a) B. The Lightning connector is one of Apple's proprietary charging and synchronization connectors used by iPads and iPhones, although Apple also uses USB-C. Micro-USB is used by older Android-based mobile devices—while USB-C is more common on newer devices. Thunderbolt is a high-speed hardware interface used in desktop com- puters, which we will discuss more in Chapter 9, "Cables and Con- nectors." IP68 deals with ingress protection from dust and water jets.

14. You are required to add long-term storage to a smartphone. Which type would you most likely add?

- B. You would most likely add a microSD card (if the smart- phone has a slot available for add-on or upgrading). This is the most common method for adding long-term storage. DDR4 is a type of RAM; it is not used for adding long-term memory storage. Some smartphones will use LPDDR4 as their main memory, but this is part of the SoC, and not accessible to the typical user. An SSD is a solid-state drive which generally means a hard drive that is installed to a PC or laptop, con- nected either as SATA or M.2. These are too large for smart- phones and tablets. A SIM is a subscriber identity module, usually represented as a small card (mini-SIM) used in smart- phones that securely stores authentication information about the user and device, such as the international mobile subscriber identity (IMSI) which we will discuss more in the following chapter.

15. The organization you work for allows employees to work from their own mobile devices in a BYOD manner. You have been tasked with setting up the devices so that they can "beam" in- formation back and forth between each other. What is this known as?

- E. "Beaming" the information back and forth can be accom- plished in a couple of ways, primarily by using near field com- munication (NFC). This can only be done if the devices are in close proximity to each other. NFC is commonly used for con- tactless payment systems. Another potential option would be Apple's AirDrop, but this relies on Bluetooth (for finding de- vices) and Wi-Fi (for transmitting data), and of course relies on using Apple-based devices. A mobile hotspot enables a smartphone or tablet to act as an Internet gateway for other mobile devices and computers. IoT stands for the Internet of Things. In the question, it said employees can use their mobile devices in a BYOD manner, but CYOD is a bit different. This means that employees can choose a device to use for work pur- poses (most likely whichever type they are more familiar with). Whether or not the employees can use those for personal purposes is usually defined by company policy. IR stands for infrared, which is less commonly found on smartphones as of 2017.

16. Which of the following can be useful in areas where a smart- phone has cellular access, but the PC (or laptop) cannot con- nect to the Internet?

- D. Tethering can allow a desktop computer or laptop to share the mobile device's Internet connection. Tethering functional- ity can be very useful in areas where a smartphone has cellular access, but the PC/laptop cannot connect to the Internet. Mo- bile device acces- sories such as headsets, speakers, gamepads,extra battery packs and protective covers are useful, however they are not used to connect to the Internet. IP codes are used to classify and rate the degree of protection against dust and water (for example, IP68). A per- fect example of a proprietary vendor-specific connector is the Apple Lightning connector that can only be used on iOS devices.

6.3 Smartphones, Tablets, and Other Mobile Devices, Part 2

1. Which of the following connections require a username, pass- word, and SMTP server? (Select the two best answers.)

- C and E. POP3 and IMAP e-mail connections require an in- coming mail server (either POP3 or IMAP) and an outgoing mail server (SMTP). Bluetooth and Wi-Fi connections do not require a username or SMTP server. Bluetooth might require a PIN, and Wi-Fi will almost always require a passcode. Ex- change connections require a

username and password, but no SMTP server. The Exchange server acts as the incoming and outgoing mail server.

2. When manually configuring a Wi-Fi connection, which step occurs after successfully entering the SSID?

   - C. After you enter the SSID (if it's correct) you would enter the passcode for the network. POP3 has to do with configuring an e-mail account. If you have already entered the SSID, then you should be within range of the wireless access point (WAP). Scanning for networks is the first thing you do when setting up a Wi-Fi connection.

3. Which of the following allows other mobile devices to wire- lessly share your mobile device's Internet connection?

   - . D. Mobile hotspot technology (sometimes referred to as Wi-Fi tethering) allows a mobile device to share its Internet connec- tion with other Wi-Fi capable devices. Another possibility would be USB tethering, but that is done in a wired fashion. NFC stands for near field communication—a technology that allows two mobile devices to send information to each other when they are in close proximity. Airplane mode will disableall wireless connectivity including (but not limited to) cellular, Wi-Fi, and Bluetooth. IMAP is another e-mail protocol similar to POP3.

4. Which of the following identifies the user of the device?

   - A. International Mobile Subscriber Identity (IMSI) or IMSI ID is used to identify the user of the device. IMEI stands for Inter- national Mobile Station Equipment Identity and identifies the phone used. In other words, the IMEI ID identifies the device itself. S/MIME (Se- cure/Multipurpose Internet Mail Exten- sions) is used for authenti- cation and message integrity and is built-in to some e-mail clients. In other words, it is used to en- crypt email. Virtual private network- ing (VPN) technology is used to make secure connections—tunneling though the provider's radio network.

5. Which of the following is the most common connection method when synchronizing data from a mobile device to a PC?

   - C) USB is the most common connection method used when syn- chronizing data from a mobile device to a PC. Though Wi- Fi and Bluetooth are also possible, they are less common. Lightning is the port found on some of Apple's mobile de- vices, but still ends in USB when connecting to a PC or Mac.

6. Which of the following is used to synchronize contacts from an iPad to a PC?

- C. PC users need iTunes to synchronize contacts and other data from an iPad to a PC. While Gmail can work to synchronize contacts, it is all based on web storage; nothing is actually stored on the iPad. Google Play is a place to get applications and other items for Android. Sync Center is a Control Panel utility that enables synchronization across Windows 10 de- vices.

7. What is it known as when a user connects to several services using several apps but with only one username and password?

- B. SSO (single sign-on) is a type of authentication where a user logs in once but is granted access to multiple services. Android Auto is a screen sharing/synchronizing app used on Android- based mobile devices to communicate with a properly equipped automobile. iTunes is a music/media program that can be used to sync up a mobile device to a PC or Apple de- vice. BT is short for Bluetooth. Exchange ActiveSync is a client-based protocol that allows a user to sync a mobile device with an Exchange Server mailbox.

6.4 Ports, Protocols, and Network Devices

1. Which protocol uses port 22?

- C. SSH (Secure Shell) uses port 22, FTP uses port 21, Telnet uses port 23, and HTTPS uses port 443.

2. Which of these would be used for streaming media?

- C. User Datagram Protocol (UDP) is used for streaming media. It is connectionless, whereas TCP is connection-oriented and not a good choice for streaming media. RDP is the Remote Desktop Protocol used to make connections to other comput- ers. DHCP is the Dynamic Host Configuration Protocol used to assign IP addresses to clients automatically.

3. Which ports are used by the IMAP protocol?

- D. The Internet Message Access Protocol (IMAP) uses port 143 by default and port 993 as a secure default. DNS uses port 53. DHCP uses port 68. HTTP uses port 80. HTTPS uses port 443. POP3 uses port 110 and 995 as a secure default. Know those ports!

4. A user can receive e-mail but cannot send any. Which protocol is not configured properly?

- C. The Simple Mail Transfer Protocol (SMTP) is probably not config- ured properly. It deals with sending mail. POP3 receives mail. FTP sends files to remote computers. SNMP is used to manage networks.

5. Which of the following is most often used to connect a group of computers in a LAN? (Select all that apply.)

- B and D. Computers in a LAN are connected by a central con- nect- ing device; the most common of which are the switch and the wireless access point (WAP). Hubs can also be used, but those are deprecated devices; they are the predecessor of the switch. A router is designed to connect two networks together. Now, you might say, "Wait! My router at home has four ports on the back for computers to talk to each other." Well, that is actually the switch portion of a SOHO "router". The actual router functionality is in the connection be- tween the two net- works—the switched LAN and the Internet. A bridge is used to connect two LANs or separate a single LAN into two sec- tions.

6. What device protects a network from unwanted intrusion?

- D. A firewall is a hardware appliance or software application that protects one or more computers from unwanted intrusion. A switch is a device that connects multiple computers together on a LAN. A router is used to connect two or more networks. An access point (or wireless access point) allows Wi-Fi-en- abled computers and devices to communicate on the LAN wirelessly.

7. Which of the following network devices moves frames of data between a source and destination based on their MAC address- es?

- B) A switch sends frames of data between computers by identi- fying the systems by their MAC addresses. A hub broadcasts data out to all computers. The computer that it is meant for ac-cepts the data; the rest drop the information. Routers enable connections with individual high-speed interconnection points and route signals for all the computers on the LAN out to the Internet. A modem is a device that allows a computer to access the Internet by changing the digital signals of the computer to analog signals used by a typical land-based phone line.

8. Which of the following network devices allows a remote de- vice to obtain Ethernet data as well as electrical power?

- B) A PoE injector sends Ethernet data and power over a single twisted-pair cable to a remote device. PD stands for "powered de- vice," the PoE-compliant remote device that is receiving the power. A repeater extends the distance of a network connec- tion. While a PoE injector can act as a repeater, not all re- peaters are PoE in- jectors. A router makes connections from one network to another or from the LAN to the Internet.

9. Which of the following devices can be configured when ac- cessed from a browser or SSH or similar configuration tool?

- A)Managed switches can be configured when accessed from a browser or SSH or similar configuration tool. For example, you can: change the device's IP address; configure ports; and monitor the switch and other devices with SNMP. On the other hand, unmanaged switches don't have these capabilities, they simply connect devices and computers together for transmis- sion of data over the Ethernet network. A patch panel is a physical hardware device that acts as a termi- nation point for all of the network cables in a building. A network interface card (NIC) allows for connectivity to a computer network. It is a physical device that can be added to a computer or networking device that has an open and compatible slot.

6.5   SOHO Networks and Wireless Protocols

1. Which of the following allows for network throttling of indi- vidual computers or applications?

- A. Quality of Service (QoS) is a technology used in SOHO routers that can throttle bandwidth, and give higher priority to individual computers or applications. Port forwarding is used to forward out- side network ports to internal IP addresses. A DMZ is a protected area between the LAN and the Internet— often inhabited by company servers. The Dynamic Host Con- figuration Protocol (DHCP) is the protocol in charge of auto- matically handing out IP address information to clients.

2. Which of the following forwards an external network port to an internal IP address/port on a computer on the LAN?

- B. Port forwarding is used to forward external network ports to an internal IP and port. This is done so a person can host ser- vices such as FTP internally. Network address translation (NAT) is used by most routers to convert the internal network of IPs to the single public IP address used by the router. The demilitarized zone (DMZ) is an area that is protected by the firewall but separate from the LAN. Servers are often placed here. DHCP is the protocol that governs the automatic assign- ment of IP addresses to clients by a server.

3. Which of the following is described as the simultaneous send- ing and receiving of network data?

- D. Full-duplex is when a network adapter (or other device) can send and receive information at the same time. Half-duplex is when only sending or receiving can be done at one time. La- tency is the delay it takes for data to reach a computer from a remote location. PoE

is Power over Ethernet, a technology that allows devices to receive data and power over an Ethernet net- work cable.

4. Which of the following would a company most likely use for authentication to a server room?

   - C. RFID (radio-frequency identification) is commonly used for access to areas of a building such as a server room. It is often implemented as a proximity-based ID card or badge. The oth- ers are not usually associated with authentication. 802.11ac is a WLAN (Wi-Fi) standard that runs on 5 GHz and can provide 1 Gbps of data transfer. 802.15-4 is the IEEE standard for Zig- bee. Z-Wave, like Zigbee, is a home automation and wirelesssensor control technology. MIMO (multiple-input and multi- ple-output) is a multiple propagation technology used to in- crease data transfer in 802.11n and 802.11ac wireless networks.

5. Which standard can attain a data transfer rate of 1 Gbps over a wireless connection?

   - D. 802.11ac can attain speeds in excess of 1 Gbps over wire- less. 802.11a and g have a typical maximum of 54 Mbps. 802.11b (rarely used today) has a maximum of 11 Mbps. 802.3ab is the IEEE speci- fication for 1 Gbps transfer over twisted pair cables—it is wired, not wireless. By the way, this is also known as 1000BASE-T

6. Which of the following is often broken down into groups of channels in- cluding 1-5, 6-10, and 11?

   - . B. In the United States, the 2.4 GHz frequency range is broken down into three categories: Channel 1-5, 6-10, and 11. By placing separate wireless networks on separate distant chan- nels (such as 1 and 11), you can avoid overlapping and inter- ference. 802.11ac and 802.11a are standards, not frequencies. 5 GHz uses channels such as 36, 40, 149, 153, and so on.

6.6   Networked Hosts and Network Configuration

1. While looking at the details of a server in your provider's con- trol panel you notice that it says "Apache" in the HTTP sum- mary. What kind of server is this?

   - B. Apache is a type of web server that runs on Linux. It is also known as Apache HTTP Server. File servers are used to store and transfer files but not websites. E-mail servers deal with the send- ing and receiving of electronic mail via POP3, IMAP, and HTTP. Authentication servers verify the identity of users log- ging in and computers on the network.

2. Which type of server acts as a go-between for clients and web- sites?

   - A. A proxy server is a caching server used to store commonly accessed websites by clients. It can be incorporated into a web server but often it runs as a stand-alone server. A print server manages network printers and their spooling of print jobs, pri- orities, and so on. A Syslog server gathers logging data from network devices and allows for the easy analysis of those logs from a client workstation. A DHCP server hands out IP ad-dresses (and other TCP/IP information) to client computers.

3. Which type of server runs Microsoft Exchange?

   - C. Microsoft Exchange is a type of e-mail server software. While you could run multiple services on a single server—for example, you could run the web server and e-mail server on the same machine—it isn't recommended. Unless you have a small office, all servers (such as file servers, authentication servers, e-mail servers, DHCP servers, and so on) should be separate entities. SCADA is not a server—it stands for Super- visory Control and Data Acquisition System, a type of system used to control larger organizations' infrastructures such as heating/cooling, electricity, and so on.

4. Which of these addresses needs to be configured to enable a computer access to the Internet or to other networks?

   - B. The gateway address must be configured to enable a com- puter access to the Internet through the gateway device. By de- fault, the subnet mask defines the IP address's network and host portions. The DNS server takes care of name resolution. The MAC address is the address that is burned into the net- work adapter; it is configured at the manufacturer.

5. Which technology assigns addresses on the 169.254.0.0 net- work number?

   - C. If you see an address with 169.254 as the first two octets, then it is Automatic Private IP Addressing (APIPA). This is also the link-local range for IPv4. The Dynamic Host Configu- ration Protocol (DHCP) assigns IP addresses automatically to clients but by default does not use the 169.254 network num- ber. Static IP addresses are configured manually by the user in the IP Properties window. Class B is a range of IP networks from 128 through 191.

6. You want to test the local loopback IPv6 address. Which ad- dress would you use?

   - B. You would use the ::1 address. That is the local loopback address for IPv6. 127.0.0.1 is the local loopback for IPv4. FE80::/10 is the range of unicast auto-configured addresses. ::0 is not valid but looks similar to how multiple zeros can be truncated with a double colon.

7. You have been tasked with compartmentalizing the network.Which of the following technologies should you use?

  - C) VLAN

6.7   Network Types and Networking Tools

1. Which of the following is a group of Windows desktop com- puters located in a small area?

  - A local area network (LAN) is a group of computers, such as a SOHO network located in a small area. A wide area net- work (WAN) is a group of one or more LANs spread over a larger geographic area. A personal area network (PAN) is a smaller computer network used by smartphones and other small computing devices. A metropolitan area network (MAN) is a group of LANs in a smaller geographic area of a city.

2. Which Internet service makes use of PSTN?

  - A) Dial-up Internet connections make use of the public switched tele- phone network (PSTN) and POTS phone lines.ISDN) was developed to meet the limitations of PSTN. DSL provides faster data transmis- sions over phone lines (or separate data lines). Cable Internet is a broadband service that offers higher speeds than DSL; it is provided by cable TV compa- nies.

3. You have been tasked with setting up a small office with the fastest In- ternet service possible. There is no fiber optic avail- ability in the area because of the rocky, hilly terrain. Which In- ternet service will typically offer the best data transfer rates?

  - D. The Internet service with the best data transfer rates will typically be cable Internet. Cable Internet service is generally "faster" than DSL. WMN stands for wireless mesh network, a type of network that uses multiple access points—but it is not an Internet service. FTTP stands for fiber to the premises, which is not available in the scenario. Fixed wireless (or line- of-sight wireless Internet service) can be offer very high data transfer rates, but it requires an unobstructed view of the provider's tower. This is probably not an option due to the rocky, hilly area where the customer's office resides.

4. Which tool is used to test a network adapter not connected to the network?

  - C. To test a network adapter without a network connection, you would use a loopback plug. This simulates a network con- nection. It can also be used to test a switch port. Punchdown tools are used to punch individual wires to a patch panel. Cable testers such as continuity testers test the entire length of a ter- minated cable. A

tone generator and probe kit can also test a cable's length, but only tests one pair of wires at a time.

5. Your boss is concerned with overlapping wireless networks from neighboring companies using 802.11ac. Which tool should you use to analyze the problem, and which frequency should you display for analysis?

- A. To analyze the problem, use a Wi-Fi analyzer! Because your boss is concerned about wireless networks using 802.11ac, you would display the results for 5 GHz networks, not 2.4 GHz. Cable certifiers are used to check long distance wired connections, for example from a patch panel to an RJ45 jack. The loopback plug is used to simulate a network connec- tion which can help with identifying switch ports, and testing a PC's network connection.

6. What would be required to attach RJ45 plugs to the ends of a single patch cable?

- D. RJ45 plugs are attached to the cable ends with a tool called a crimper. A tone generator and probe kit is used to trace hard to find telecommunication and data communication ca- bles/wires. A multimeter can be used to test continuity of a patch cable. A cable stripper is used to strip a portion of the plastic jacket off the cable, exposing the individual wires.

6.8   Cables and Connectors

1. Which of the following would be suitable for 1000 Mbps net- works? (Select all that apply.)

- C and D. Category 5e and Category 6 are suitable for 1000 Mbps networks (and Cat 6 is also suitable for 10 Gbps net- works). Category 3 is suitable for 10 Mbps networks only. It is outdated and you most likely won't see it. Category 5 is suit- able for 100 Mbps networks. In general, Cat 3 and Cat 5 net- works should be upgraded.

2. Which type of cable would you use if you were concerned about EMI?

- C. STP (shielded twisted pair) is the only cable listed here that can reduce electromagnetic interference. However, fiber optic cable is another good solution, though it will be more expen- sive, and more difficult to install. Plenum-rated cable is used where fire code requires it; it doesn't burn as fast, releasing fewer PVC chemicals into the air.

3. You have been tasked with connecting a newer Android-based smartphone to an external TV so that you can display the CEO's smartphone screen during a meeting. Which of the fol- lowing adapters would be the best solution typically.?

- E. Typically, you would use USB-C to HDMI. If it is a newer Android-based smartphone, then chances are that it will have aUSB-C port. If you are attempting to connect it to a TV, then HDMI is the most likely port to use. Micro-USB is used with many mobile devices, but newer devices especially Android- based devices) have switched to, or are moving toward USB- C. We wouldn't want USB-C to DVI because TVs normally don't have DVI inputs. USB to Ethernet helps to convert from a computer or mobile device to the Ethernet network. These devices can ultimately allow a device or computer with a USB port to access the Internet. This wired connection might be fa- vored over wireless for its speed, quality connection, and low latency.

4. Which type of cable can connect a computer to another com- puter directly?

   - B. A crossover cable is used to connect like devices: computer to computer or switch to switch. Straight-through cables (the more common patch cable) do not connect like devices (for example, they connect from a computer to a switch). 568B is the typical wiring standard you will see in twisted-pair cables; 568A is the less common standard. A crossover cable uses the 568B wiring standard on one end and 568A on the other end. (By the way, sometimes you will see these written as T568A and T568B.) SATA is used to connect hard drives internally to a desktop or laptop computer.

5. Which connector is used for cable Internet?

   - B. Cable Internet connections use RG-6 coaxial cable (usually) with an F-connector on the end. LC is a type of fiber optic con- nector. BNC is an older connector type used by coaxial net- works. RJ45 is the connector used on twisted-pair patch ca- bles. DE-9 (or DB-9) is a serial connector used with RS-232 connections.

6. Which cable type would be suitable for longer distances such as connecting two cities?

   - D. Single-mode fiber is used for longer distance runs, perhapsfrom one city to the next (as far as thousands of kilometers). Coaxial is common for connections between utility poles and houses/buildings. Twisted pair is common in LANs. Multi- mode cables have a larger core diameter than single-mode ca- bles. It is the more commonly used fiber optic cable in server rooms and when making network backbone connections be- tween buildings in a campus.

6.9   RAM and Storage

1. Which of the following types of cloud services offers e-mail through a web browser?

- A. Software as a service (SaaS) is the most commonly recog- nized cloud service; it allows users to use applications to ac- cess data that is stored on the Internet by a third party. Infras- tructure as a service (IaaS) is a service that offers computer networking, storage, load balancing, routing, and VM hosting. Platform as a service (PaaS) is used for easy-to-configure op- erating systems and on-demand computing. A community cloud is mix of public and private clouds, but one where multi- ple organizations can share the public portion.

2. Your organization requires more control over its data and in- frastructure. Money is apparently not an issue. There are only two admins and about 30 users that will have access to the data on the cloud. Which of the following types of clouds is the best option?

   - B. The best option listed is a private cloud. This gives the most control over data and resources in an environment where there are limited users (and a healthy budget). These resources could be en- tirely internal, or a portion of them could also be pro- vided by a third-party. Public cloud technology is used for the general public to access applications over the Internet. Hybrid is a mixture of the two, but not necessary in this situation be- cause of the budget and the limited number of users. Commu- nity cloud is similar to hybrid but is meant for multiple organi- zations that share data, which is not necessary in this scenario.

3. You require the ability to add on to your cloud-based network whenever necessary, rapidly and efficiently. What is this refer- ring to?

   - C. Rapid elasticity is the ability to build your cloud-based net- work, or extend upon an existing one, quickly and efficiently. Measured services is when a provider monitors a customer's services used so that the customer can be properly billed. Metered services is when the customer can access as many re- sources as needed but only be billed for what was accessed. On-demand service means that the cloud service is available at all times. The leaders of a successful organization don't care what it takes; they simply want high speed, secure access to services 24/7.

6.10   RAM and Storage

1. What is the transfer rate of DDR4-2133?

   - A. The transfer rate of DDR4-2133 is 17,066 MB/s. It is also known as PC4-17000. 19,200 MB/s is the speed of DDR4-2400 (PC4-19200). 21,333 MB/s is the speed of DDR4-2666 (PC4- 21333). 25,600 MB/s is the speed of DDR4-3200 (PC4-25600).

2. How many pins are on a DDR3 memory module?

- C. DDR3 is a 240-pin architecture. 288-pin is DDR4, 184-pin is the first version of DDR (DDR1), and you can find 200-pin architectures in laptops; they are known as SODIMMs. To review, Table 10.2 shows the pin configurations for PCbased DDR 1 through 4.

3. Which of the following allows for a 256-bit wide bus?

- B. The quad-channel memory architecture can allow for a 256-bit wide bus (64-bit per channel). However, this will only be the case if all four channels have memory installed to them. ECC stands for error correction code which can detect and correct errors in RAM. Parity is when the RAM stores an extra bit used for error detection. DDR2 is a type of DRAM that for the most part was used in either single-channel or dual-channel environments.

4. How much data can a SATA revision 3.0 drive transfer per second?

- D. SATA Revision 3.0 drives can transfer 6.0 Gb/s, which after encoding amounts to 600 MB/s. SATA Revision 3.2 is 16 Gb/s (1969 MB/s) but requires SATA Express or M.2. 50 MB/s is a typical write speed for Blu-ray discs and some flash media. 90 MB/s is a typical write speed for an SD card.

5. Which level of RAID stripes data and parity across three or more disks?

- C. RAID 5 stripes data and parity across three or more disks. RAID 0 does not stripe parity; it stripes data only and can use two disks or more. RAID 1 uses two disks only. Striping is an- other name for RAID 0. RAID 10 contains two sets of mir- rored disks that are then striped.

6. Which of the following has the largest potential for storage ca- pacity?

- D. Blu-ray, at a typical maximum of 50 GB, has the largest storage capacity. CDs top out just under 1 GB. DVDs have a maximum of 17 GB.

7. A customer complains that an important disc is stuck in the computer's DVD-ROM drive. What should you recommend to the customer?

- C. Tell the customer to use a paper clip to eject the DVD-ROM tray. Disassembling the drive is not necessary; the customer shouldn't be told to do this. If the disc is rewritable, formatting it would erase the contents, even if you could format in thisscenario. Never tell a customer to dispose of a DVD-ROM drive; they rarely fail.

8. Which of the following best describes a specification for ac- cessing storage while using PCI Express?

- A. Non-Volatile Memory Express (NVMe) is a specification for accessing storage while using PCI Express. Essentially, the M.2 slot on a motherboard taps into the PCI Express bus (x4) and uses a portion of the total bandwidth associated with that bus. The platters in a hard disk drive (HDD) rotate at a certain speed, for example 7,200 RPM, which is common; other typi- cal speeds include 5,400 RPM and 10,000 RPM. Hot-swap- pable capability is when drives can be removed and inserted while the system is on. SATA-based hard drives come in two main widths: 3.5" and 2.5". The 3.5" drive is used in desktop computers, network-attached storage and other larger devices. The 2.5" drive is used in laptops and other smaller devices.

6.11   Motherboards and Cards

1. Which motherboard form factor measures 12 inches × 9.6 inches (305 mm × 244mm)?

   - C. ATX boards measure 12 inches × 9.6 inches (305 mm × 244mm). microATX boards are square and measure 9.6 × 9.6 inches (244 mm × 244 mm). SATA is a type of hard drive technology and the port used to connect hard drives to the motherboard. mITX (or Mini-ITX), also square, measures 6.7 × 6.7 inches (17 cm × 17 cm) .

2. Which component supplies power to the CMOS when the computer is off?

   - A. The lithium battery supplies power to the CMOS when the computer is off. This is because the CMOS is volatile and would otherwise lose the stored settings when the computer is turned off

3. To implement a secure boot process, which device should be listed first in the Boot Device Priority screen?

   - D. To ensure that other users cannot boot the computer from removable media, set the first device in the Boot Device Priority screen to hard drive.

4. Which of the following connectors would you use to power a video card?

   - B. A video card is normally powered by a 6-pin or 8-pin PCIe connector. Lesser cards are simply powered by the PCIe bus. The 24-pin power connector is the main connector that leads from the power supply to the motherboard. Molex is used for fans, older IDE drives, and other secondary devices. 3.5 mm TRS (or 1/8 inch) is an audio connection.

5. Which of the following is a chip that stores encryption keys?

- D. To perform hard drive encryption, some motherboards come with a trusted platform module (TPM), a chip that stores encryption keys —it can be enabled in the BIOS. Intel Virtualization Technology (VT) is part of the firmware that supports the use of virtualization software such as Hyper-V and VMware. Secure boot can block rootkits and other malware from launching boot loaders that have been tampered with. Firmware (such as a motherboard's BIOS) is should be updated or "flashed" periodically to take advantage of the latest functionality and security updates.

6.12 CPUs

1. What does Hyper-Threading do?

   - C. Hyper-Threading allows for an operating system to send two simultaneous threads to be processed by a single CPU core. The OS views the CPU core as two virtual processors. Multiple cores would imply multicore technology, which means there are two physical processing cores within the CPU package. HyperTransport is a high-speed connection used by AMD from the CPU to RAM.

2. What seals the tiny gaps between the CPU cap and the heat sink

   - D. Thermal compound/thermal paste is used to seal the small gaps between the CPU and heat sink. It is sometimes referred to as thermal gel or jelly (among a variety of other names), but not grape jelly. (Did I ever tell you about the time I found grape jelly inside a customer's computer? Fun times.) Note: Never use petroleum-based products (such as 3-in-1 oil or WD-40) inside a computer; the oils can damage the components over time. TDP stands for thermal design power.

3. Which of the following can be defined as the amount of heat generated by the CPU, which the cooling system is required to dissipate?

   - B. TDP (thermal design power) is the amount of power required to cool a computer and is linked directly to the amount of heat a CPU creates. Some CPUs come with a built-in graphics processing unit (GPU). This means that with a compatible motherboard, no separate video card is necessary. PSU stands for power supply unit. 140 watts is a potential TDP rating but does not define what TDP is.

4. When deciding on a CPU for use with a specific motherboard, what does it need to be compatible with?

   - B. The CPU needs to be compatible with the socket of the motherboard. The case doesn't actually make much of a difference when it comes to the CPU. (Just make sure it's large enough!) There is no

wattage range, but you should be concerned with the voltage range of the CPU. PCI Express (PCIe) slots don't actually play into this at all because there is no direct connectivity between the two

5. Which kind of socket incorporates "lands" to ensure connectivity to a CPU?

   - C. LGA (Land Grid Array) is the type of socket that uses "lands" to connect the socket to the CPU. PGA sockets have pinholes that make for connectivity to the CPU's copper pins. AM4 is a PGA socket that accepts AMD CPUs such as the Ryzen 7.

6. Which of the following enables the user to increase the base clock within the BIOS, thereby increasing the clock speed of the CPU?

   - A. Overclocking enables the user to increase the clock speed of the CPU within the BIOS. Level 3 (L3) cache comes in the largest capacities of the three types of cache and has the most latency; therefore, it is the slowest. If the CPU can't find what it needs in L1, it moves to L2 and finally to L3. An integrated GPU is a video adapter that is built into the motherboard. The heat sink helps to dissipate heat from the CPU and is usually aided by a fan or liquid cooling system.

6.13   Peripherals and Power

1. What does a KVM do?

   - D. A KVM connects multiple computers to a single keyboard, mouse, and monitor. This way, fewer resources in the way of peripherals (input/output devices) are necessary to use the computers.

2. Which of the following are considered both input and output devices?

   - D) Smart TVs, touchscreens, KVMs, and headsets are consid- ered both input and output devices. Keyboards, mice, touch-pads, smart card readers, motion sensors, and biometric de- vices are considered input devices. Printers and speakers are considered output devices.

3. Which of the following devices can be used to perform combi- nation shortcuts?

   - A.A keyboard can be used to perform combination shortcuts. An example of a shortcut key is Ctrl + P which initiates a print job within an application. While a KVM will have a keyboard connected to it, it's at the keyboard that you perform the short- cut operation.

4. Which of the following incorporate the concept of resolution. (Select all that apply).

- B, C, and E. The mouse, printer, and LED display all deal with resolution. A mouse's sensitivity is rated in DPI; for ex- ample, 800 DPI is a low resolution for mice. A printer will commonly print out documents at the resolution 600 DPI (more on that in Chapter 15, "Printers and Multifunction De- vices". A monitor will commonly have a resolution of 1920 x 1080 (or greater!)

5. Which of the following terms describes how the light output from a video projector is measured?

   - C. A video projector's light output is measured in lumens. In- plane switching (IPS) technology allows for a wider viewing angle. Some LCDs use a cold cathode fluorescent lamp (CCFL) as the lighting source instead of LEDs. OLED stands for organic light-emitting diode—that's the lighting material used in the display.

6. Which power connector should be used to power an SATA hard drive?

   - D. 15-pin connectors power SATA hard drives and other SATA de- vices (such as optical drives). Molex connectors power fans, older IDE devices, and other secondary devices. 6-pin power connectors are used for video cards (as are 8-pin connectors). 24-pin refers to the main power connection for the motherboard.

7. Which voltages are supplied by a Molex power connector?

   - A. Molex connectors provide 12 volts and 5 volts. There are four wires: if color-coded, yellow is 12 V, red is 5 V, and the two blacks are grounds.

8. A company salesperson just returned to the United States after three months in Europe. Now the salesperson tells you that her PC, which worked fine in Europe, won't turn on. What is the best solution?

   - D. Most likely, the voltage selector was set to 230 V so that it could function properly in Europe (for example, in the UK). It needs to be changed to 115 V so that the power supply can work properly in the United States. Make sure to do this while the computer is off and unplugged.

9. Which of the following can have 8 pins? (Select all that apply).

   - A and D. PCIe power can be 8-pin or 6-pin. CPU power (EATX12V) can be 8-pin or 4-pin. SATA power is 15-pin (and data is 7-pin). ATX main power is typically 24-pin. Molex is a 4-wire connector; it is sometimes also referred to as "peripheral".

6.14   Custom PCs and Common Devices

1. Which of the following is the best type of custom computer for use with Pro Tools?

    - B. Audio/video editing workstation

2. Which of the following would include a gigabit NIC and a RAID array?

    - D. NAS

3. Your organization needs to run Windows in a virtual environment. The OS is expected to require a huge amount of resources for a powerful application it will run. What should you install Windows to?

    - C. Type 1 hypervisor

4. You have set up a user to work at a thin client. They will be accessing the OS image and data from a Windows Server 2016 as well as data from the Google Cloud. Which of the following does this configuration not require? (Select the two best an- swers.)

    - . C and E. This configuration will not need a hard drive, be it M.2 or other SSD. Thin clients are meant to use an OS that is embedded in RAM (or other similar memory) or more often, grab an image from a server, often as a virtual machine. To do so, the thin client will need a network connection (wired or wireless), and every computer needs a CPU.

5. A customer has a brand new Chromebook and needs help con- figuring it. Which of the following should you help the user with? (Select the three best answers.)

    - A, B and D. You should show the user how to configure the touchpad and touchscreen, and guide the user through the ini- tial account setup. Chrome OS is a fairly simple system com- pared to Windows and other operating systems. To configure devices, simply go to the "Home" or app launcher button, then Settings, then Devices. The registry is a Windows configura- tion tool—even if this was a Windows computer, the typical user has no place in the registry. The App Store is Apple's ap- plication download site. Google uses the Play Store. The Task Manager is another Windows utility. Consider writing a short user guide in Word document format if you have multiple users accessing the same type of system for the first time. Write it once, and train many!

6. Where would you go in Windows to enable printer sharing?

    - B. The Network and Sharing Center in Windows is where printer sharing is enabled. Network Connections is the window that shows

the Ethernet and Wi-Fi connections a PC has to the network. Windows sharing has to be done in Windows, it can'tbe done from the printer's on-screen display (OSD). Bonjour is a macOS service, that can also be run on Windows which en- ables automatic discovery of devices on the LAN.

7. Your printer supports printing to both sides of paper. What should you enable in the Printing preferences?

- C. Duplexing (as it relates to printers) means to print to both sides. Collating means printing multiple copies of a docu- ment's pages in sequence, instead of printing all of the copies of one page at a time. Orientation is how the print job is dis- played on the paper; it could be portrait (vertically—the de- fault), or landscape (horizontal). Quality refers to the clarity of the print job, usually measured in dots per inch (DPI)—the higher the DPI the better.

8. Which of the following address printer data privacy concerns? (Select the two best answers.)

- A and D. Implement user authentication for the printer or print server (PIN or password), and clear the cache on the printer. Bluetooth ad hoc mode network printing can be used by mo- bile devices where no wireless access point exists. AirPrint is an Apple technology for macOS and iOS used to automatically locate and download drivers for printers.

9. During which step of the laser printing/imaging process is the transfer corona wire involved?

- B. The transfer corona wire gets involved in the laser print- ing imaging process during the transferring step.

10. Which stage of the laser printing/imaging process involves ex- treme heat?

- A. The fusing step uses heat (up to 400 degrees Fahrenheit/200 degrees Celsius) and pressure to fuse the toner permanently to the paper.

11. Which represents the proper order of the laser printing/imaging process?

- D. The proper order of the laser printing/imaging process is process- ing, charging, exposing, developing, transferring, fus- ing, cleaning.

12. Which of the following are associated with inkjet printers?

- .B. Inkjet printer components include ink cartridge, print head, roller, feeder, duplexing assembly, carriage, and belt. Imaging drum, fuser assembly, transfer belt, transfer roller, pickup rollers, separate pads,

and duplexing assembly are associated with laser printers. Feed assembly, thermal heating unit, and thermal paper are associated with thermal printers. Print head, ribbon, tractor feed, and impact paper are associated with im- pact printers.

13. When finished installing a new printer and print drivers, what should you do? (Select all that apply.)

    - A and D. After the printer is installed (meaning it has been connected and the drivers have been installed), you should cal- ibrate the printer (if necessary) and print a test page. You should also consider updating the firmware for the printer. Be- fore starting the installation, you should check for compatibil- ity with operating systems, applications, and so on.

6.15 Cloud Computing and Client-side Virtualization

1. Which of the following types of cloud services offers e-mail through a web browser?

    - A. Software as a service (SaaS) is the most commonly recog- nized cloud service; it allows users to use applications to ac- cess data that is stored on the Internet by a third party. Infras- tructure as a service (IaaS) is a service that offers computer networking, storage, load balancing, routing, and VM hosting. Platform as a service (PaaS) is used for easy-to-configure op- erating systems and on-demand computing. A community cloud is mix of public and private clouds, but one where multi- ple organizations can share the public portion.

2. Your organization requires more control over its data and in- frastructure. Money is apparently not an issue. There are only two admins and about 30 users that will have access to the data on the cloud. Which of the following types of clouds is the best option?

    - B. The best option listed is a private cloud. This gives the most control over data and resources in an environment where there are limited users (and a healthy budget). These resources could be entirely internal, or a portion of them could also be pro- vided by a third-party. Public cloud technology is used for the general public to access applications over the Internet. Hybrid is a mixture of the two, but not necessary in this situation be- cause of the budget and the limited number of users. Commu- nity cloud is similar to hybrid but is meant for multiple organi- zations that share data, which is not necessary in this scenario.

3. You require the ability to add on to your cloud-based network whenever necessary, rapidly and efficiently. What is this refer- ring to?

- C. Rapid elasticity is the ability to build your cloud-based net- work, or extend upon an existing one, quickly and efficiently. Measured services is when a provider monitors a customer's services used so that the customer can be properly billed. Metered services is when the customer can access as many re- sources as needed but only be billed for what was accessed. On-demand service means that the cloud service is available at all times. The leaders of a successful organization don't care what it takes; they simply want high speed, secure access to services 24/7.

4. Of the following listed technologies, which one should you se- lect if wanted to run an instance of Ubuntu Linux within your Windows 10 Pro work-station?

   - B. You would need to run virtualization software that includes a Type 2 hypervisor such as Windows 10 Hyper-V, VMwareWorksta-tion, or VirtualBox. Type 1 hypervisors are used on servers; they are also known as bare metal because they allow virtual machines to access the computer hardware directly. Ex- amples include VMware vSphere and Windows Server-based Hyper-V. An emulator is some-thing that imitates hardware and firmware, such as an emulated BIOS. They do not use hypervi- sors.

5. Which of the following is the greatest risk of a virtual comput- er?

   - D. The biggest risk of running a virtual computer is that it will go offline immediately if the server that it is housed on fails. All other virtual computers on that particular server will also go offline immediately.

6. Which of the following file extensions is used by VMware?

   - A. VMware uses the .vmdk file extension for the virtual hard drive file. VirtualBox uses .vdi by default (though it can use others). Hyper-V uses .vhdx. VT-x is the Intel virtualization extension that is incorporated into Intel-based systems and must be enabled in the UEFI/BIOS for virtualization software to work.

7. Which of the following network connection types should be used to allow for connectivity to the external network, but keep the VMs on a separate IP network?

   - B. Network address translation (NAT)-based network connec- tions are the most common default. This allows the VMs to have their own IP network, but still connect out to the external network and make use of the Internet. This is the same princi- ple behind NAT used in a SOHO network. Bridged means that the VMs have access to the external network, but they must use IP addresses from that external network. Private means that multiple VMs within a host

can communicate with each other, but not beyond the host. The no networking option dis- ables any type of networking connectivity for the VM in ques- tion.

8. A customer running Windows 10 Pro wishes to install a Linux VM in Hyper-V Manager. Which of the following require- ments must be met in order for this to happen? (Select all that apply.)

   - B, C and D. Virtualization must be enabled in the UEFI/BIOS. Then, Hyper-V needs to be turned on in Windows Features. Finally, the system needs to be restarted. Updating and secur- ing the host system is recommended, but is not a requirement.

6.16

1. What is the second step of the A+ troubleshooting methodology?

   - B. The second step is to establish a theory of probable cause. You need to look for the obvious or most probable cause for the problem.

2. When you run out of possible theories for the cause of a prob- lem, what should you do?

   - A. If you can't figure out why a problem occurred, it's time toget someone else involved. Escalate the problem to your super- visor.

3. What should you do before making any changes to the comput- er? (Select the best answer.)

   - C. Always perform a backup of critical data before making any changes to the computer.

4. Which of the following is part of Step 5 in the six-step trou- bleshooting process?

   - D. Implement preventative measures as part of Step 5 to ensure that the problem will not happen again.

5. What should you do next after testing the theory to determine cause?

   - A. After testing the theory to determine cause (Step 3), you should establish a plan of action to resolve the problem (Step 4). Memorize the six-step troubleshooting process! You will use it often.

6. There is a problem with the power supplied to a group of com- puters and you do not know how to fix the problem. What should you do first?

   - B. Contact the building supervisor or your manager.

7. What is the best way to tell if a CR2032 lithium battery has been dis- charged?

- C. Although there might be a Windows application that moni- tors the battery, the surefire way is to test the voltage of the lithium battery with a multimeter. A CR2032 lithium battery is designed to run at 3 volts. Some UEFI/BIOS programs can also monitor the voltage of the battery.

8. A PC reboots without any warning. You ruled out any chance of viruses. When you look at the motherboard, you see that some of the capacitors appear distended and out of shape. What should you do?

   - A. You should replace the motherboard if it is damaged. It would be much too time-consuming to even attempt replacing the capacitors and probably not cost-effective for your compa- ny.

9. A computer you are troubleshooting won't boot properly. When you power on the computer, the video display is blank and you hear a series of beeps. What should you do?

   - B. You should check the BIOS version and consult the docu- menta- tion that accompanies the motherboard. You might need to go online for this information. You can also try performinga POST analysis to discern the problem. The issue could be video-based, or RAM-based, but the beep code should help to identify the problem.

10. You are troubleshooting a CPU and have already cut power, disconnected the power cable, opened the case, and put on your antistatic strap. What should you do next?

    - B. Check connections first; it is quick, easy, and a common culprit.

11. What is a possible symptom of a failing CPU?

    - A. If the CPU is running beyond the recommended voltage range for extended periods of time, it can be a sign of a failing CPU. If the computer won't boot at all, another problem might have occurred, or the CPU might have already failed. Low case temperatures are a good thing (if they aren't below freez- ing!). Spyware is unrelated, but we talk about it plenty in the security chapters.

12. You are repairing a computer that has been used in a ware- house for several years. You suspect a problem with a memory module. What should you do first?

    - C. Because the computer is being used in a warehouse (which is of- ten a fairly dirty environment), you should use compressed air on the RAM slot and clean the memory module with con- tact cleaner. Clean out all of the dust bunnies within the entire computer. Us- ing MemTest86 or another memory diagnostic tool is another good answer.

13. You just investigated a computer that is suffering from inter- mittent shutdowns. You note that the RAM modules are over- heating. What is the best solution?

    - C. The best thing to do in this situation is to install heat sinks on the RAM modules. On older computers, the memory con- troller in a northbridge doesn't usually overheat because it al- ready has a heat sink; on newer computers, it is within the CPU. A CPU can have only one fan. You can't install more (although an additional case fan might help). The chipset also usually has a heat sink.

14. You just installed new, compatible RAM into a motherboard, but when you boot the computer, it does not recognize the memory. What should you do?

    - A. If you are sure that the RAM is compatible and the system doesn't recognize it during POST, try flashing the UEFI/BIOS. It could be that the RAM is so new that the motherboard doesn't have the re- quired firmware to identify the new RAM.

15. You are troubleshooting a computer that won't power on. You have al- ready checked the AC outlet and the power cord, which appear to be functioning properly. What should you do next?

    - A. You should test the computer with a PSU tester. This can tell you whether the power supply functions properly. You al- ready know that the AC outlet is functional, so there is no rea- son to use another outlet. The computer would still turn on if the RAM wasn't seated properly. A UPS won't help the situa- tion because it is part of the power flow before the power sup- ply.

16. A computer you are troubleshooting shuts down without warn- ing. After a few minutes, it boots back up fine, but after running for a short time, it shuts down again. Which of the following components could be the cause? (Select the two best answers.)

    - A and D. The two components that could cause the system to shut down are the power supply and the CPU fan. Check the CPU fan settings and temperature in the BIOS first before opening the com- puter. If those are fine, you most likely need to replace the power supply. The RAM, video card, and hard drive should not cause the system to suddenly shut down.

6.17 Troubleshooting Hard Drives and RAID Array

1. What should you do first to repair a drive that is acting slug- gish?

- C. Attempt to defragment the disk. If it is not necessary, Win- dows lets you know. Then you can move to other options, such as scanning the drive for viruses.

2. Which of the following are possible symptoms of hard drive failure? (Select the two best answers.)

    - A and C. System lockups and failed boot files or other failing file operations are possible symptoms of hard drive failure. Antivirus alerts tell you that the operating system has been compromised, viruses should be quarantined, and a full scan should be initiated. Sometimes hard drives can fail due to heavy virus activity, but usually if the malware is caught quickly enough, the hard drive should survive. Network drives are separate from the local hard drive; inability to connect to a network drive suggests a network configuration issue. If theBIOS doesn't recognize the drive, consider a BIOS update.

3. You just replaced a SATA hard drive that you suspected had failed. You also replaced the data cable between the hard drive and the motherboard. When you reboot the computer, you no- tice that the SATA drive is not recognized by the BIOS. What most likely happened to cause this?

    - C. Most likely, the SATA port is faulty. It might have been damaged during the upgrade. To test the theory, you would plug the SATA data cable into another port on the mother- board. We can't format the drive until it has been recognized by the BIOS, which, by the way, should recognize SATA drives if the motherboard has SATA ports! SATA drives don't use jumpers unless they need to coexist with older IDE drives. Most of today's drives do not come with jumpers.

4. You are troubleshooting a SATA hard drive that doesn't func- tion on a PC. When you try it on another computer, it works fine. You suspect a power issue and decide to take voltage readings from the SATA power connector coming from the power supply. Which of the following readings should you find?

    - C. If you test a SATA power cable, you should find 3.3 V (or- ange wire), 5 V (red wire), and 12 V (yellow wire). If any of these don't test properly, try another SATA power connector.

5. You are troubleshooting a Windows Server that normally boots from an SATA-based RAID 0 array. The message you receive is "missing operating system". As it turns out, another techni- cian has been updating the BIOS on several of the servers in your organization, including this one. What configured setting needs to be changed? (Select the best answer.)

    - B. When the BIOS was updated, the SATA setting in the BIOS probably reverted back to AHCI. That caused the RAID 0 ar- ray to be ignored, and so the OS would not boot, because it is stored

on that array. The setting should be changed from AHCI to RAID (or similar name). Now, if this was a RAID 1 mirror, then a copy of the OS would be on each drive, and it might still boot (though you would probably receive a message as to the state of the mirror being degraded or broken). But with RAID 0, the OS is striped across two or more drives—all drives need to be present and accessed via RAID in order for the OS to boot. That's one of the reasons why the golden rule for many years was to "mirror the OS, and stripe the data". Phew! Any- ways, on to the incorrect answers. RAID 1 is incorrect, there would be no option to set this; in the scenario we are using RAID 0. S.M.A.R.T. is the monitoring system included in HDDs and SSDs. NVMe (Non-Volatile Memory Express) isthe specification for non-volatile storage used by M.2 drives, PCIe card-based drives, and so on. Remember to backup any and all BIOS configurations!

6. What should you do first if your SATA magnetic disk begins to make loud clicking noises? (Select the best answer.)

- A. Don't hesitate! Copy the data to another drive. Afterward, update the UEFI/BIOS, replace the drive with a new one, and consider a new SATA cable while you are at it.

6.18   Troubleshooting Video Issues and Mobile Devices

1. A user set the resolution in Windows too high, resulting in a scrambled, distorted display. What should you do to fix the problem? (Select the best answer.)

- B. Boot into a low-resolution mode. In Windows, this is called Enable Low-Resolution Video. Safe Mode is another valid op- tion, but keep in mind that Safe Mode loads Windows with a minimal set of drivers and you can't access the Internet. Depending on the display configuration, pressing the monitor toggle key might actually fix the problem temporarily by dis- playing the screen on a secondary monitor, but it doesn't solve the root cause of the problem.

2. You are troubleshooting a video issue. Which utility should you use?

- C. You should use DxDiag to troubleshoot video issues. The other three answers are not used to troubleshoot video. Regedit is used to perform advanced configurations in the registry. Ms- config is used to change how the system boots and enable/dis- able services. The Task Manager is used to see the perfor- mance of the computer and view applications and processes that are running. We'll discuss the rest of those tools in more depth in the Windows portion of this book.

3. You receive a very basic computer that has a broken on-board DVI connector. What should you attempt first?

   - . C. Try installing a video card first to see if the system will still work. Unless it is a specialized system, the video card should be less expensive than the motherboard. (Not to mention it will take a lot less time to install.) As PC techs, we usually do not replace connectors; it is a possibility, but it should be further down your troubleshooting list. An adapter cannot help if the DVI port is broken.

4. You just replaced a video card in a PC with another card from a different manufacturer. However, the driver installation does not complete. What should you do first?

   - . C. If the driver installation doesn't complete, you should roll back the driver. It could be that you have attempted to install the incorrect driver. After you roll back the faulty installation, find the correct latest version of the video driver from the man- ufacturer's website. Installing the driver again can most likely have the same result. Only reinstall the original video card temporarily if you cannot find a proper solution right away.

5. A user's mobile device is overheating. Which of the following could be the problem? (Select the two best answers.)

   - A and C. The best answers listed are a damaged battery and excessive gaming. If the brightness setting is low, the device should use less power and run cooler. If the device is not in a case, it should not overheat; however, a poorly manufactured case could cause it to overheat. A defective charging cable will usually not cause the device to overheat; if it is defective, it likely is not even charging the device.

6. You are troubleshooting a user's smartphone. The user informs you that he can't see anything on the screen. Of the following, what should you do first?

   - C. Check the brightness slider first! Chances are that the brightness is turned all the way down—in a bright environ- ment, it might appear that nothing is on the screen. Or, the de- vice might simply need to be woken up—use the side button, home button, or double-tap the screen to wake the device up. If these are not successful, restart the device. Screen calibration has nothing to do with brightness, but on some more rare mo- bile devices it might be necessary. The volume sliders are not part of the problem. Don't open the device until you have ex- hausted every other known option!—and only if you are quali- fied to work on that device, otherwise send it to an authorized repair center.

7. When disassembling a mobile device, what should you not do?

- E. Stay away from magnetically charged tools such as screw- drivers and bits. These can potentially damage circuitry andcomponents. All of the other answers were valid procedures; things you should do when working on mobile devices, and computers in general.

6.19 Troubleshooting Wired and Wireless Network Problems

1. A user complains that the computer is not connecting to the network. Which of the following should be done first?

   - C. Check the super-obvious first. Make sure the computer hasa physical cabled connection to the network. Then attempt things such as ipconfig, ping, and network driver up- dates.

2. One computer loses connectivity. All connectors and settings appear to be correct. Which tool should be used to fix the prob- lem?

   - D. Use a patch cable tester to check the patch cable and possi- bly use a continuity tester to test longer network cable runs. Multimeters are great for testing wires inside the computer or AC outlets, but they are not used for network troubleshooting. A PSU tester tests power supplies. The loopback plug will ver- ify whether the local computer's network adapter is functional.

3. One of your customers no longer has access to a frequently ac- cessed website. You ping another computer and the router on the network suc- cessfully. Which of the following should be done next?

   - B. This is the concept of pinging outward. Start by pinging the localhost, then a computer, and then the router on the network. Then ping a domain name or website. If you can ping the web- site but the browser cannot get through, the browser might have been compromised. If you cannot ping the website, you should check the IP configuration; the DNS server address might be incorrectly configured. Updating the OS and AV software should be done right away if you guess that the browser has been compromised.

4. A user moves a laptop from one office to another. The patch cable and the network adapter do not appear to be working properly at the new office. The cable is plugged in correctly and tests okay when checked with a patch tester. Which of the following should be done first?

   - A. Some routers and switches can disable physical ports (a smart security measure). Check that first. Later, you can check whether the network adapter is compatible with the OS and up- date it if necessary. Do not replace the cable with a crossover; those are used to connect one computer to another.

7 CompTIA A+ Premium

1. Which of the following are components you might find inside a PC?

   - **Answers: A, B, and E** Explanation: Common components inside a PC include the CPU, motherboard, and RAM, along with the power supply, adapter cards, and hard drives

2. Which device stores data over the long term?

   - **Answer: C** Explanation: The hard drive stores data over the long term. The hard drive stores the OS and data in a nonvolatile fashion, meaning the data won't be erased when the com- puter is turned off.

3. To which type of technology would you install a x16 card?

   - **Answer: B** Explanation: PCI Express (PCIe) expansion slots accept x1, x4, and x16 cards (pronounced "by one", "by four", and "by sixteen" respectively).

4. Which process of the computer checks all your components during boot?

   - **Answer: B** Explanation: The POST (power-on self-test) is part of the Basic Input/Output System (BIOS) or Unified Extensible Firmware Interface (UEFI). It runs a self-check of the com- puter system during boot and stores many of the parameters of the components within the CMOS.

5. Tim installs a new CPU in a computer. After a few hours, the processor starts to overheat. Which of the following might be the cause?

   - **Answer: C** Explanation: Without the thermal compound applied, the processor might overheat after a few hours.

6. Which of the following could cause the POST to fail? (Select the two best answers.)

   - **Answers: A and D** Explanation: The CPU and memory need to be installed properly for the POST to run (and to pass).

7. Which of the following might you find as part of a tablet computer? (Select the two best answers.)

   - **Answers: A and C** Explanation: A tablet computer will almost always contain flash memory as main stor- age and a multi-touch touchscreen.

8. Which kind of socket incorporates "lands" to ensure connectivity to a CPU?

   - **Answer: C** Explanation: LGA (land grid array) is the type of socket that uses "lands" to connect the socket to the CPU.

9. How should you hold RAM when installing it?

- **Answer: A** Explanation: Hold RAM by the edges to avoid contact with the pins, chips, and cir- cuitry.

10. You have been tasked with setting up a specialized computer for video editing. Which of the following should you include with the computer? (Select the two best answers.)

- **Answers: C and E** Explanation: You should incorporate a solid-state drive (SSD) and dual monitors for the video editing workstation. Video files, such as .MP4 and .AVI, are considerable; they are big files that require a decent-size hard drive. An SSD, possibly an M.2 or similar drive, helps to work with these files efficiently, especially in the video rendering stage. And having dual monitors (or more than two) is important when editing. You will generally want to have an editing window and a separate playback window.

11. How many pins are inside an SATA 3.0 data connector?

- **Answer: B** Explanation: The SATA version 3.0 data connector has seven pins. Note: SATA Express uses a triple connector with 18 pins $(7 + 7 + 4)$.

12. What is the delay in the RAM's response to a request from the memory controller called?

- **Answer: A** Explanation: Memory latency or CAS (column address strobe) latency happens when a memory controller tries to access data from a memory module. It is a slight delay (usually measured in nanoseconds) while the memory module responds to the memory controller. It is also known as CL. The memory controller (also known as the northbridge) has a specific speed at which it operates. If the CPU asks the chip for too much information at once, this might increase latency time while the memory control- ler works.

13. What is the minimum number of hard drives necessary to imple- ment RAID 5?

- **Answer: C** Explanation: Because RAID 5 uses striping with parity, a third disk is needed. You can have more than three disks as well.

14. A user's time and date keep resetting to January 1, 2012. Which of the following is the most likely cause?

- **Answer: D** Explanation: If the time and date keep resetting—for example, to a date such as January 1, 2012—chances are that the lithium battery needs to be replaced. These are usually nickel-sized batteries; most PCs use a CR2032 lithium battery.

15. Which type of adapter card is normally plugged into a PCIe x16 adapter card slot?

    - Answer: B Explanation: The PCI Express (PCIe) x16 expansion slot is used primarily for video

16. Which of the following is a common type of CPU for a smart- phone?

    - Answer: B Explanation: System on a chip (SoC) is a type of CPU used in smartphones and tablet computers. The 64-bit versions are common in mobile devices; they incorporate a vari- ety of functionality within the CPU.

17. Which of the following components could cause the POST to beep several times and fail during boot?

    - **Answer: D** Explanation: RAM is one of the big four (RAM, CPU, motherboard, and video) that can cause the POST to fail. Differ- ent RAM errors can cause the POST to make a different series of beeps. Consult your motherboard documentation for more informa- tion about the different beep codes.

18. Which of the following are ports you might find on smartphones and tablets?

    - **Answers: B and C** Explanation: Mobile devices such as smart- phones and tablets commonly incorporate ports such as USB-C (and micro USB) and Apple's Lightning connector.

19. Which of the following has the fastest data throughput?

    - **Answer: C** Explanation: RAM is much faster than the rest of the options listed. For instance, if you have PC4-25600 DDR4 RAM (aka DDR4-3200), your peak transfer rate is 25,600 MB/s.

20. Which of the following CPU cooling methods is the most common?

    - **Answer: B** Explanation: The most common CPU cooling method is the heat sink and fan combi- nation. The heat sink helps the heat to disperse away from the CPU, whereas the fan blows the heat down and through the fins; the power supply exhaust fan and possibly additional case fans help the heat escape the case. Heat sink and fan combinations are known as active cooling methods.

21. You are tasked with fixing a problem with a video editing workstation. There is an unexpected clicking noise every time the video editing pro- gram is started. The case fans have been replaced, but the noise remains. Diagnostics have also been run on a the video card, and it appears to be operating normally. What action should you take first?

- **Answer: D** Explanation: The first action you should take is to perform a full data backup. Clicking noises can indicate that the computer's magnetic-based hard drive is damaged and might fail. Immediately back up the drive's contents before taking any other action.

22. Which of the following is not a video port?

    - **Answer: D** Explanation: S/PDIF is not a video port. It stands for Sony/Philips digital interface format—a digital audio interconnect that can be used with fiber-optic TOSLINK con- nectors or coaxial RCA connectors.

23. Which of the following is necessary for a CAD/CAM workstation?

    - Answers: A and D Explanation: A computer-aided design/computer-aided manufacturing workstation requires an SSD, high-end video, and as much RAM as possible. The CPU can also be important to run the latest design applications such as AutoCAD. Always check the minimum and recommended requirements for applications.

24. Which of the following technologies allow two mobile devices to transfer data simply by touching them together?

    - **Answer: B** Explanation: Near field communication (NFC) allows two mobile devices such as smartphones to transfer data simply by touching them together (or bringing them in very close proximity of each other).

25. What type of power connector is used for a x16 video card?

    - **Answer: C** Explanation: A x16 card is a PCI Express card. It can have one or two PCIe 6-pin power connectors (or 8-pin).

26. Which of the following are output devices?

    - **Answers: A, D, and E** Explanation: Speakers, printers, and displays are output devices. A speaker outputs sound. A printer outputs paper with text and graphics. A display (or monitor) displays video.

27. What does the b in 1000 Mbps stand for?

    - **Answer: B** Explanation: The b in 1000 Mbps stands for bits: 1000 Mbps is 1000 megabits per second or 1 gigabit per second. Remember that the lowercase b is used to indicate bits when measuring network data transfer rates, USB data transfer rates, and other similar serial data transfers.

28. When running cable through drop ceilings, which type of cable do you need?

- **Answer: D** Explanation: Plenum-rated cable needs to be installed wherever a sprinkler system is not able to spray water. This includes ceilings, walls, and plenums (airways). Plenum- rated cable has a protective covering that burns slower and gives off fewer toxic fumes than regular PVC-based cable.

29. Which device connects multiple computers in a LAN?

- **Answer: C** Explanation: A switch connects computers together in a local-area network (LAN). In SOHO networks, it is usually a part of a multifunction network device. In larger net- works, the switch is an individual device that has 24, 48, or 96 ports.

30. Which of the following is the default subnet mask for IP address 192.168.1.1?

- Answer: B Explanation: 192.168.1.1, by default, has the subnet mask 255.255.255.0, which is the standard subnet mask for class C IP ad- dresses. However, remember that some net- works are classless, which means that a network can use a different subnet mask.

31. Which of the following is the minimum category cable needed for a 1000BASE-T network?

- Answer: C Explanation: The minimum cable needed for 1000BASE-T networks is Category 5e. Of course, Cat 6 would also work, but it is not the minimum of the listed answers. 1000BASE-T specifies the speed of the network (1000 Mbps), the type (baseband, single shared channel), and the cable to be used (T = twisted pair).

32. Which of the following IP addresses can be routed across the Internet?

- **Answer: C** Explanation: The only listed answer that is a public address (needed to get onto the Internet) is 129.52.50.13.

33. Which port number is used by HTTPS by default?

- **Answer: D** Explanation: The Hypertext Transfer Protocol Secure (HTTPS) uses port 443 (by default).

34. Which of the following cable types have a copper medium? (Select the three best answers.)

- **Answers: A, B, and D** Explanation: Twisted-pair, coaxial, and Category 7 cable are all examples of network cables with a copper medium. They all send electricity over copper wire.

35. Which of the following cable types can protect from electromag- netic interference (EMI)? (Select the two best answers.)

- **Answers: B and C** Explanation: Shielded twisted pair (STP) and fiber optic can protect from EMI.

36. You are configuring Bob's computer to access the Internet. Which of the following are required? (Select all that apply.)

   - **Answers: A and B** Explanation: To get on the Internet, the DNS server address is required so that the computer can get the resolved IP addresses from the domain names that are typed in. The gateway address is necessary to get outside the network.

37. Which of the following translates a computer name into an IP address?

   - **Answer: C** Explanation: The Domain Name System (DNS) protocol translates a computer name into an IP address. Whenever you type a web server name such as dprocomputer.com, a DNS server translates that name to its corresponding IP address.

38. A customer wants to access the Internet from many different loca- tions in the United States. Which of the following is the best tech- nology to enable the customer to do so?

   - **Answer: B** Explanation: Cellular WAN uses a phone or other mobile device to send data over stan- dard cellular connections.

39. You just configured the IP address 192.168.0.105 in Windows. When you press the Tab key, Windows automatically configures the default subnet mask of 255.255.255.0. Which of the following IP addresses is a suitable gateway address?

   - Answer: D Explanation: 192.168.0.1 is the only suitable gateway address. Remember that the gateway address must be on the same network as the computer. In this case, the net- work is 192.168.0, as defined by the 255.255.255.0 subnet mask.

40. A wireless network is referred to as which of the following?

   - Explanation: The Service Set Identifier (SSID) is the name of the wireless network. This is the name you look for when locating a wireless network.

41. You have been tasked with blocking remote logins to a server. Which of the following ports should you block?

   - **Answer: B** Explanation: Port 23 should be blocked. It is associated with the Telnet service, which is used to remotely log in to a server at the command line. You can block this service at the company firewall and individually at the server and other hosts. It uses port 23 by default, but it can be used with other ports as well. Telnet is considered to be inse- cure, so it should be blocked and disabled.

42. Which of the following connector types is used by fiber- optic cabling?

- Explanation: The LC connector is used by fiber-optic cabling. Other fiber connectors include SC and ST.

43. Which protocol uses port 53?

    - C. DNS

44. Which of the following Internet services are wireless? (Select the two best answers.)

    - B. Satellite, D. Cellular

45. Which of the following terms best describes two or more LANs connected over a large geographic distance?

    - **Answer: B** Explanation: A wide-area network (WAN) is a network in which two or more LANs are connected over a large geographic distance—for example, between two cities. The WAN requires connections to be provided by a telecommunications or data communications company.

46. Which device connects to the network and has the sole purpose of providing data to clients?

    - **Answer: A** Explanation: Network-attached storage (NAS) devices store data for network use. They connect directly to the network.

47. You are making your own networking patch cable. You need to attach an RJ45 plug to the end of a twisted-pair cable. Which tool should you use?

    - C. Crimper

48. Which port is used by RDP?

    - **Answer: D** Explanation: The Remote Desktop Protocol (RDP) uses port 3389 by default. This pro- tocol allows one computer to take control of another remote system.

49. Which key on a laptop aids in switching to an external monitor?

    - **Answer: A** Explanation: The Fn (Function) key is used for a variety of things, including toggling between the built-in LCD screen and an external monitor/TV. The Fn key could be a different color (for example, blue) and offers a sort of "second" usage for keys on the laptop.

50. Which of the following printer failures can be described as a condition in which the internal feed mechanism stopped working temporarily?

- **Answer: C** Explanation: A failure that occurs due to the internal feed mechanism stopping is known as a paper jam. For example, an HP LaserJet might show error code 13.1 on the display, which means a paper jam at the paper feed area. You should verify that the paper trays are loaded and adjusted properly.

51. A customer can barely hear sound from the speakers on her lap- top. What should you do first?

   - **Answer: C** Explanation: Sometimes, the volume key(s) on laptops can be a little difficult to locate and may be muted or set to the lowest position (which might still make a slight audible noise). The volume is usually controlled by pressing the Fn key and the Volume Up or Volume Down key (or mute) simultaneously.

52. After you replace a motherboard in a PC, the system overheats and fails to boot. Which of the following is the most likely cause?

   - C. Thermal paste was not applied between the heat sink and the CPU.

53. You use your laptop often. Which of the following is a simple, free way to keep your laptop running cool?

   - Explanation: Laptops have airflow underneath them; if the unit is not on a flat surface, that airflow will be reduced or stopped altogether, leading to component damage.

54. Which of the following are important factors when purchasing a replacement laptop AC adapter? (Select the two best answers.)

   - **Answers: A and B** Explanation: Make sure to purchase an AC adapter that is a true replacement. You can find one on the laptop manufacturer's website. When you enter your model number, the website will tell you everything you need to know about current, voltage, and con- nector type (these details are also listed on the brick portion of the power adapter).

55. Eric uses an external monitor with his laptop. He tells you that his laptop will boot, but the system won't display anything on the external screen. Which of the following solutions enables the display?

   - **Answer: B** Explanation: The Screen key (also known as the display toggle) is one of the keys available when you use the Function (Fn) key. It enables you to switch between the lap- top display and an external display (or if you want to use both).

56. Which type of printer uses a toner cartridge?

   - Answer: B Explanation: Laser printers use toner cartridges.

57. Which of the following should not be connected to a UPS?

- **Answer: C** Explanation: Laser printers use large amounts of electricity, which in turn could quickly drain the battery of the UPS. They should be plugged in to their own individual power strips.

58. Terri finishes installing a printer for a customer. What should she do next?

- **Answer: B** Explanation: Print a test page after installation. If the test page prints properly, printing a page in Word should be unnecessary.

59. Which of the following best describes printing in duplex?

- **Answer: A** Explanation: When you are printing "duplex," you are printing on both sides of the paper (if the printer has that capability). Some laser printers can do this, but printing this way creates a longer total paper path, which leads to more frequent paper jams.

60. Special paper is needed to print on which type of printer?

- Answer: B Explanation: Regular paper can be used on all the listed printers except for thermal printers, which use specially coated paper that is heated to create the image.

61. Which of the following channels should you select for an 802.11 wireless network?

- **Answer: A** Explanation: Of the listed answers, use channel 6 for 802.11 wireless networks. That would imply a 2.4 GHz connection using either 802.11n, g, or b. The 2.4 GHz frequency range in the United States allows for channels 1 through 11.

62. Which environmental issue affects a thermal printer the most

- **Answer: D** Explanation: Heat is the number-one enemy to a thermal printer. Keeping a thermal printer or the thermal paper in a location where the temperature is too high could cause failure of the printer and damage to the paper.

63. Which of the following occurs last in the laser printing process?

- **Answer: E** Explanation: In the laser printing process, also known as the imaging process, the cleaning stage happens last.

64. Which type of printer uses impact to transfer ink from a ribbon to the paper?

- **Answer: C** Explanation: Impact is a type of impact printer. It uses a printhead to physically impact the ribbon and transfer ink to the paper.

74

65. Which of the following steps enables you to take control of a net- work printer from a remote computer?

- **Answer: C** Explanation: After you install the driver for the printer locally, you can then take control of it by going to the properties of the printer and accessing the Ports tab. Then click the Add Port button and select the Standard TCP/IP Port option. You have to know the IP address of the printer or the computer that the printer is connected to.

66. A color laser printer produces images that are tinted blue. Which of the following steps should be performed to address this problem?

- **Answer: B** Explanation: After you install a printer, it is impor- tant to calibrate it for color and ori- entation, especially if you are installing a color laser printer or an inkjet printer. These calibration tools are usually built in to the printer's software and can be accessed from Windows, or you can access them from the printer's display.

67. A laptop cannot access the wireless network. Which of the fol- lowing statements best describes the most likely causes for this? (Select the two best answers.)

- **Answers: A and C** Explanation: Most laptops have a special func- tion key (for example, F12) that allows you to enable or disable the Wi-Fi connection just by pressing it. Also, a wireless net- work can be "forgotten" in the operating system. If this happens, the laptop has to be reconnected to the wireless network.

68. A desktop computer does not have a lit link light on the back of the computer. Which of the following is the most likely reason for this?

- **Answer: D** Explanation: The most likely answer in this scenario is that the network cable is dis- connected. If the desktop computer is using a wired connection, it is most likely a twisted-pair Ethernet connection. When this cable is connected to the computer on one end and to a switch or other central connecting device on the other end, it initiates a network connection over the physical link. This link then causes the network adapter's link light to light up. The link light is directly next to the RJ45 port of the network adapter. The corresponding port on the switch (or other similar device) is also lit. If the cable is disconnected, the link light becomes unlit, though there are other possibilities for this link light to be dark—for example, if the computer is off or if the switch port is disabled.

69. Which of the following IP addresses would a technician see if a computer running Windows is connected to a multifunction net- work device and is attempting to obtain an IP address automati- cally but is not receiving an IP address from the DHCP server?

- **Answer: C** Explanation: If the computer fails to obtain an IP address from a DHCP server, Windows will take over and apply an Automatic Private IP Address (APIPA). This address will be on the 169.254.0.0 network.

70. For which type of PC component are 80 mm and 120 mm common sizes?

- **Answer: A** Explanation: Case fans are measured in mm (millimeters); 80 mm and especially 120 mm are very common. They are used to exhaust heat out of the case. These fans aid in keeping the CPU and other devices cool. The 120 mm is quite common in desktop and tower PCs, and the 80 mm is more common in smaller systems and 1U and 2U rackmount servers.

71. An exclamation point next to a device in the Device Manager indi- cates which of the following?

- **Answer: A** Explanation: If you see an exclamation point in the Device Manager, this indicates that the device does not have a proper driver.

72. Beep codes are generated by which of the following?

- **Answer: C** Explanation: As the power-on self-test (POST) checks all the components of the com- puter, it may present its findings on the screen or in the form of beep codes.

73. Which of the following indicates that a printer is network-ready?

- **Answer: C** Explanation: The RJ45 jack enables a connection to a twisted-pair (most likely Ethernet) network. Printers with a built-in RJ45 connector are network-ready; so are printers that are Wi-Fi enabled.

74. You just turned off a printer to maintain it. Which of the following should you be careful of when removing the fuser?

- **Answer: A** Explanation: The fuser heats paper to around 400° Fahrenheit (204° Celsius). That's like an oven. If you need to replace the fuser, let the printer sit for 10 or 15 minutes after shutting it down and before maintenance.

75. Which of the following connectors is used for musical equipment?

- **Answer: A** Explanation: The Musical Instrument Digital Interface (MIDI) connector is used for musical equipment such as keyboards, synthesizers, and sequencers. MIDI is used to create a clocking signal that all devices can synchronize to.

76. Which of the following tools is not used as often as a Phillips screwdriver but is sometimes used to remove screws from the outside of a computer case or from within a laptop?

- **Answer: B** Explanation: The Torx screwdriver (also known as a Torx wrench) is a special tool used to remove screws from the outside of a case; often, proprietary computer manu- facturers use these screws. This tool can also be used to remove screws (albeit smaller ones) from a laptop. The standard is the size T10 Torx screwdriver, but you might also use a T8 or even a T6 on laptops.

77. Moving your CPU's speed beyond its normal operating range is called .

- **Answer: A** Explanation: Overclocking is the act of increasing your CPU's operating speed beyond its normal rated speed.

78. Which of the following is the most important piece of information needed to connect to a specific wireless network?

- **Answer: C** Explanation: The Service Set Identifier (SSID) is the most important piece of informa- tion required to connect to a wireless network; it is the name of the wireless network.

79. You are considering a cloud-based service for file storage and syn- chronization. Which of the following resources is the most critical to your design?

- **Answer: D** Explanation: I/O bandwidth is the most critical of the listed resources in the question. When you are considering file storage and file synchronization, you need to know the maximum input/output operations per second (IOPS) that the cloud provider can deliver. (Get actual reports of previous customers as proof!) IOPS gives you a concrete measurement of data that you can use for analysis.

80. Which of the following statements describes why the display on a laptop gets dimmer when the power supply from the AC outlet is disconnected?

- **Answer: B** Explanation: The power management settings on the laptop can cause the display to automatically dim when the AC adapter is unplugged. In fact, this is the default on many laptops to conserve battery power. These settings can be configured within Power Options in Windows.

7.1   Exam 2

1. Which of the following servers is responsible for resolving a name such as dprocomputer.com to its corresponding IP address?

- Answer: C Explanation: A Domain Name System (DNS) server is responsible for resolving (or converting) hostnames and domain names to their corresponding IP addresses. To see this in action, open the command line and try connecting to a domain (such as dprocomputer.com) and run a ping, tracert (or traceroute in Linux and macOS), nslookup, or dig (or all of those) against the domain name. These commands can supply you with the IP address of the host. Remember, always practice in a hands-on manner on real computers to reinforce your knowledge!

2. Which of the following statements describe advantages of using the Dynamic Host Configuration Protocol (DHCP)? (Select the two best answers.)

- Answers: A and E Explanation: Advantages of using DHCP include the following: IP addresses can be managed from a central location, and computers can automatically get new addressing when moved to a different network segment (perhaps one that uses a different DHCP server).

3. Which of the following storage technologies is used by hard disk drives?

- Answer: A Explanation: Hard disk drives (HDDs) are magnetic disks. These are the type with moving parts, as opposed to solid-state drives (SSDs) that have no moving parts.

4. On which type of computer is RAM the most important

- Answer: B Explanation: RAM is more essential to the virtualization workstation than any of the other types of custom PCs listed. Virtual operating systems (virtual machines or VMs) require a lot of RAM to run, much more than any other application. Plus, a virtualization workstation often has more than one virtual machine running, increasing its need for RAM even further.

5. A client brings in a printer that is giving a paper-feed error. Which of the following is the most likely cause?

- Answer: D Explanation: Paper-feed errors are often caused by the pickup rollers, which are in charge of feeding the paper into the printer.

6. Which protocol uses port 389?

- Answer: C Explanation: Port 389 is used by the Lightweight Directory Access Protocol (LDAP). Although 389 is the default port, 636 is also used for secure LDAP.

7. What is the maximum distance at which a Class 2 Bluetooth device can receive signals from a Bluetooth access point?

- Answer: B Explanation: Class 2 Bluetooth devices have a maximum range of approximately 10 meters. Class 2 devices (such as Bluetooth headsets) are the most common.

8. Which of the following wireless networking standards operates at 5 GHz only? (Select the two best answers.)

   - Answers: A and E Explanation: 802.11a operates at 5 GHz only; so does 802.11ac.

9. Which of the following types of RAM has a peak transfer rate of 21,333 MB/s?

   - Answer: D Explanation: DDR4-2666 has a peak transfer rate of 21,333 MB/s. It runs at an I/O bus clock speed of 1333 MHz and can send 2666 megatransfers per second (MT/s). It is also known as PC4-21333. The math: To figure out the data transfer rate of DDR4 from the name "DDR4-2666," simply multiply the 2666 by 8 (bytes) and solve for megabytes: 21,333 MB/s. To figure out the data transfer rate of DDR4 by the consumer name "PC4-21333," just look at the number within the name and add "MB/s" to the end. To figure out the data transfer rate when given only the I/O bus clock speed (for example, 1333 MHz), multiply

10. Which of the following types of printers uses a print head, ribbon, and tractor feed?

    - Answer: B Explanation: The impact printer uses a print head, ribbon, and tractor feed. An example of an impact printer is the dot matrix.

11. Several users on your network are reporting that a network printer, which is controlled by a print server, is not printing. What is the first action you should take to fix the problem?

    - Answer: C Explanation: The first thing you should try (of the listed answers) is to clear the print queue. How this is done will vary depending on the type of print server being used. For example, if the printer is being controlled by a Windows Server, that server will have the Print Management role installed. From the Print Management console window, you can access the printer in question and locate the queue. In most client Windows operating systems (such as Windows 10), you can find the queue simply by double-clicking the printer. Regardless of the OS, it is where you would normally go to manage print jobs. Then, after you have found the queue, delete any pending or stalled jobs. One of those print jobs might have been causing a delay, possibly if the print job was too big or was corrupted. Of course, you will have to notify users that any jobs as of x time frame have

been deleted and they will need to be printed again. On some printers you can clear the print queue from the onscreen display (OSD) directly on the printer. Or, if the print server is built into a SOHO router or similar device, you would have to access it from a browser.

12. Which of the following is a possible symptom of a failing CPU?

   - Answer: A Explanation: If the CPU is running beyond the recommended voltage range for extended periods of time, it can be a sign of a failing CPU. The problem could also be caused by overclocking. Check in the UEFI/BIOS to see whether or not the CPU is overclocked.

13. Which of the following cable types is not affected by EMI but requires specialized tools to install?

   - Answer: C Explanation: Fiber-optic cable is the only answer listed that is not affected by electromagnetic interference (EMI). The reason is that it does not use copper wire or electricity, but instead uses glass or plastic fibers and light.

14. Setting an administrator password in the BIOS accomplishes which of the following?

   - Answer: A Explanation: Setting an admin password in the UEFI/BIOS prevents a user from rearranging the boot order. The idea behind this is to stop a person from attempting to boot off an optical disc or USB flash drive. As an administrator, you should change the BIOS boot order to hard drive first. Then apply an administrative password. That'll stop 'em right in their tracks!

15. Which of the following functions is performed by the external power supply of a laptop?

   - Explanation: The external power supply of the laptop converts AC to DC for the system to use and for charging the battery. It is known as the power adapter, and it needs to run at a very specific voltage. In fact, different make and model power adapters usually do not work with different laptops, even if the voltages are only slightly different.

16. How many pins would you see in a high-quality printhead on a dot-matrix printer?

   - Answer: A Explanation: High-quality dot-matrix printheads can come in 9, 18, or 24 pins, with 24 being the highest quality.

17. What is an LCD display's contrast ratio defined as?

- Answer: C Explanation: Contrast ratio is the brightness of the brightest color (measured as white) compared to the darkest color (measured as black). Static contrast ratio measurements are static; they are performed as tests using a checkerboard pattern. But there is also the dynamic contrast ratio, a technology in LCD displays that adjusts dynamically during darker scenes in an attempt to give better black levels. It usually has a higher ratio, but it should be noted that there is no real uniform standard for measuring contrast ratio.

18. Which of the following tools can protect you in the case of a surge?

- Answer: B Explanation: Most antistatic straps come with a 1-megaohm resistor, which can protect against surges. However, the best way to avoid a surge is to (1) make sure the computer is unplugged before working on it, (2) not touch any components that hold a charge, and (3) stay away from live electricity sources. In other words, this means: don't open power supplies or CRT monitors; don't touch capacitors on any circuit boards such as motherboards; and, of course, stay away from any other electrical devices, wires, and circuits when working on computers

19. Which of the following connectors can have audio and video pass through it?

- Answer: D Explanation: High-Definition Multimedia Interface (HDMI), as the word multimedia implies, can transmit video and audio signals. Incorrect answers: VGA, RGB, and DVI are video

20. Which of the following devices limits network broadcasts, seg- ments IP address ranges, and interconnects different physi- cal media?

- Answer: D Explanation: A router can limit network broadcasts through segmenting and programmed routing of data. This is part of a router's job when connecting two or more networks. It is also used with different media. For example, you might have a LAN that uses twisted-pair cable, but the router connects to the Internet via a fiber-optic connection. That one router will have ports for both types of connections.

21. Which of the following technologies can be used to make wireless payments?

- Answer: C Explanation: Near-field communication (NFC) is a wireless technology that allows mobile devices to transfer data simply by touching or being in close proximity to each other, as well as make payments wirelessly to some point-of-sale (POS) systems.

22. You just upgraded the CPU. Which of the following issues can make your computer shut down automatically after a few minutes? (Select the best answer.)

- Answer: D Explanation: The CPU could overheat if thermal compound has not been applied correctly (which is common) or if it is not seated properly (which is rare).

23. Which of the following addresses is a valid IPv4 address for a net- work host?

  - Answer: C Explanation: Of the answers listed, 172.17.58.254 is the only valid IPv4 address for a network host. A host on the network is any computer or network device that uses an IP address to communicate with other computers or devices. 172.17.58.254 is a class B private IP address, so it fits the description of a valid IPv4 address for a network host.

24. You want to upgrade memory in your computer. Which of the fol- lowing is user-replaceable memory in a PC?

  - Answer: C Explanation: Dynamic random-access memory (DRAM) is a module (or stick) of memory that you can install into a motherboard. SDRAM, DDR, DDR2, DDR3, and DDR4 are all examples of DRAM.

25. Which of the following IP addresses is private?

  - Answer: C Explanation: 172.31.1.1 is the only address listed that is private. It is within the class B range of private addresses: 172.16.0.0–172.31.255.255.

26. Which of the following is the local loopback IPv6 address?

  - Answer: B Explanation: The IPv6 loopback address used for testing is ::1. This determines if IPv6 is working correctly on the network card but does not generate network traffic. It exists on every computer that runs IPv6.

27. Which of the following statements is correct concerning IPv6 addresses?

  - Answer: C Explanation: The only statement that is correct concerning IPv6 is that it uses 128-bit addressing. This is compared to IPv4, which uses 32-bit addresses.

28. Which of the following operating CPU temperatures is typical?

  - Answer: B Explanation: A typical operating temperature for CPUs is 60° Celsius. Keep in mind that the operating range may be above or below that. Many computers hover around 30° to 35° Celsius.

29. Which of the following printer technologies should be used to print payroll checks on paper forms that have a carbon backing?

- Answer: A Explanation: The impact printer technology is what you want. This strikes the ribbon and consequently the paper with a printhead. The physical hammering action causes the carbon backing to apply text to the next layer of paper. Multipart forms such as these are commonly used for receipts.

30. Which of the following is not a configuration that can be made in the UEFI/BIOS?

   - Answer: D Explanation: You cannot install drivers to the UEFI/BIOS. Drivers are software that allows the operating system to communicate with hardware; they can be configured in the Device Manager in Windows.

31. Which of the following traits and port numbers are associated with POP3? (Select the two best answers.)

   - Answers: A and E Explanation: POP3 is a protocol used by email clients to receive email. It makes use of either port 110 (considered insecure) or port 995 (a default secure port).

32. Which type of cable should be used to connect a laptop directly to a PC?

   - Answer: D Explanation: To connect one computer to another directly by way of network adapter cards, use a crossover cable. (The category such as 5e or 6 doesn't matter.) That cable is designed to connect like devices. It is wired as T568B on one end and T568A on the other. Those standards are ratified by the Telecommunications Industry Association/ Electronic Industries Alliance (TIA/EIA).

33. To perform a network installation of Windows, which of the following must be supported by the computer's network interface card?

   - Answer: A Explanation: Network installations require that the network card be configured for Preboot eXecution Environment (PXE). This allows the network card to boot off the network, locate a network installation server, and request that the installation begin. This configuration might be done in the UEFI/BIOS of the computer (if the network adapter is integrated to the motherboard), within a special program in Windows, or in one that boots from disc or other removable media (if the network adapter is an adapter card).

34. Which of the following devices is the least likely to be replaced on a laptop?

   - Answer: A Explanation: The CPU is the least likely to be replaced. You would probably need to replace other equipment, too, in this case. Just like PCs, though, the CPU should rarely fail. Incorrect

35. If your "bandwidth" is 1000 Mbps, how many bits are you sending/ receiving? (Select the two best answers.)

- Explanation: 1000 Mbps is 1000 megabits per second, otherwise notated as 1,000,000,000 bits per second, or 1 gigabit per second.

36. Which of the following can send data the farthest?

   - Answer: B Explanation: Single-mode fiber-optic cable can send data farther than any of the other answers—up to hundreds of kilometers.

37. You need to expand the peripherals of a computer, but the system doesn't have enough ports. Which type of card should be installed?

   - Answer: C Explanation: You should install a USB add-on card. This will give you more ports than the computer already has for use with peripherals. Another option—and a more common option at that—would be to purchase a USB hub.

38. Which of the following is the typical speed of an SATA hard disk drive?

   - Answer: D Explanation: A typical speed of a magnetic hard disk drive is 7200 RPM—rotational speed, that is. Other common rotational speeds include 5400 RPM, 10,000 RPM, and 15,000 RPM. Note: Solid-state hard drives do not have a magnetic disk and therefore are not given an RPM rating or a latency rating.

39. Which of the following best describes the differences between a switch and a router?

   - A. A switch interconnects devices on the same network so that they can communicate; a router interconnects one or more networks.

40. A group of users in ABC Corp. needs to back up several gigabytes of data daily. Which of the following is the best media for this scenario?

   - Answer: D Explanation: In a large corporation (or enterprise environment), tape backup such as Linear Tape-Open (LTO) or Digital Linear Tape (DLT) is the best media for backing up.

41. The organization you work for has three locations within a city that need to be networked together. The network requirement for all three locations is a minimum data throughput of 1 Gbps. Which of the following network types are most likely to be used for internal office and office-to-office communications? (Select the two best answers.)

   - Answers: A and D Explanation: The organization will most l kely use local-area networks (LAN) for each office and a metropolitan-area network (MAN) to connect the three networks. The LANs meet the requirements for each office's internal communications. Most LANs operate at 1 Gbps or faster. The MAN meets the requirement for the connection between the offices within the city. A MAN is the right choice because it can harness the power of fiber-optic cables and

other technologies that already exist in the city limits and provide for 1 Gbps or more throughput.

42. Which of the following is a type of virtualization software?

- Answer: D Explanation: VMware is an example of virtualization software. Actually, VMware is the company, and it makes a multitude of software including virtualization software such as VMware Workstation and VMware ESXi.

43. You need to replace and upgrade the memory card in a smartphone. Which type of memory is most likely used by the smartphone?

- Answer: D Explanation: Smartphones typically use Secure Digital (SD) cards—more to the point, microSD cards.

44. Your organization relies heavily on its server farm for resources and is less reliant on the client computers. Which type of client computer is most likely used by the organization?

- Answer: C Explanation: In this scenario, the organization probably has thin client computers for its users. These computers have operating systems that are embedded in flash memory, and the rest of the information they require comes from a server. Thin clients normally have no hard drive; this is why they are referred to as diskless workstations.

45. Which of the following statements describe the respective functions of the two corona wires in a laser printer? (Select the two best answers.)

- Answers: A and B Explanation: Know the main steps of the laser printer imaging process: processing, charging, exposing, developing, transferring, fusing, and cleaning. In the charging step, the drum is conditioned/charged by the primary corona wire (negatively charging it) and is prepared for writing. In the transferring step, the paper is positively charged by the transfer corona wire, preparing it to accept the toner from the drum.

46. Which of the following tools should be used to test a 24-pin ATX 12v power connector?

- Answer: B Explanation: When testing the main 24-pin ATX power connector that leads from the power supply to the motherboard, use a power supply unit tester (PSU tester) or a multimeter. The multimeter can test each individual wire's voltage, but the PSU tester can test them all in one shot.

47. Which of the following uses port 427?

- Answer: C Explanation: The Service Location Protocol (SLP) uses port 427. It enables access to network services without previous configuration of the client computer.

48. Which of the following ports is used by AFP?

- Answer: F Explanation: The Apple Filing Protocol (AFP) uses port 548. AFP offers file services for Mac computers running macOS and can transfer files across the network.

49. Which of the following does a laptop have yet a tablet does not?

- Answer: A Explanation: Tablets do not have a touchpad; instead, you use your finger(s) or a stylus to tap on the display (known as a touchscreen).

50. At the beginning of the workday, a user informs you that her computer is not working. When you examine the computer, you notice that nothing is on the display. Which of the following should be done first?

- Answer: B Explanation: When troubleshooting a computer system, always look for the most likely and simplest solutions first. The fact that the user might not have turned on her monitor when she first came in is a likely scenario.

51. A customer reports that when his computer is turned on, the screen is blank except for some text and a flashing cursor. He also tells you that there are numbers counting upward when the computer beeps and then freezes. Which of the following is the most likely cause of this problem?

- Answer: A Explanation: Chances are that the computer has faulty memory or a memory module that needs to be reseated properly. The flashing cursor on the screen tells you that the system is not posting properly. The numbers counting up are the system checking the RAM. If the system beeps and freezes during this count-up, the RAM has an issue. It could also be incompatible with the motherboard.

52. Joey's computer was working fine for weeks, yet suddenly it cannot connect to the Internet. Joey runs the command ipconfig and sees that the IP address his computer is using is 169.254.50.68. Which of the following statements describes the most likely issue?

- Answer: A Explanation: If you get any address that starts with 169.254, the computer has self assigned that address. It is known as an APIPA (Automatic Private IP Addressing) address, a type of link-local address. Normally, DHCP servers do not use this network number. A simple ipconfig/release and ipconfig/renew might fix the problem, if a DHCP server is actually available

53. Which of the following could cause a ghosted image on the paper outputted by a laser printer?

   - Answer: D Explanation: Ghosted images or blurry marks could be a sign that the drum has some kind of imperfection or is dirty, especially if the image reappears at equal intervals. Replace the drum (or toner cartridge). Another possibility is that the fuser assembly has been damaged and needs to be replaced.

54. Mary installed a new sound card and speakers; however, she cannot get any sound from the speakers. Which of the following statements describe the most likely cause? (Select all that apply.)

   -

55. A laptop with an integrated 802.11 WLAN card is unable to connect to any wireless networks. Just yesterday the laptop was able to connect to wireless networks. Which of the following statements describes the most likely cause?

   - C. The wireless card firmware requires an update.

56. The IP address of dprocomputer.com is 216.97.236.245. You can ping that IP address, but you cannot ping dprocomputer.com. Which of the following statements describes the most likely cause?

   - Answer: C Explanation: The purpose of a DNS server is to resolve (convert) hostnames and domain names to the IP address. Computers normally communicate via IP address, but it is easier for humans to type in names. If dprocomputer.com is down, you cannot ping the corresponding IP address at all.

57. A newly built computer runs through the POST, but it doesn't recognize the specific CPU that was just installed. Instead, it recognizes it as a generic CPU. Which of the following is the first thing you should check?

   - Answer: B Explanation: You must have the correct firmware to recognize the latest CPUs. A BIOS flash can fix many problems related to unidentified hardware.

58. Which of the following commands displays a network interface card's MAC address?

   - Answer: B Explanation: Ipconfig/all shows a lot of information, including the MAC address, as well as the DNS server, DHCP information, and more.

59. A customer reports that print jobs sent to a local printer are printing as blank pieces of paper. Which of the following can help you determine the cause?

- Answer: D Explanation: First, try printing an internal test page, meaning from the printer's onscreen display. If that doesn't work, you need to start troubleshooting the printer. Perhaps the toner cartridge is empty, or maybe a corona wire is malfunctioning.

60. Signal strength for a laptop's wireless connection is low (yellow in color and only one bar). The laptop is on the first floor of a house. The wireless access point (WAP) is in the basement. Which of the following can improve signal strength? (Select the two best answers.)

- Answers: A and B Explanation: The easiest and (probably) cheapest way is to move the WAP. Basements are usually the worst place for an access point because of concrete foundations and walls, electrical interference, and so on. Signal boosters might also work, but often the cost of a signal booster is the same as buying a newer, more powerful WAP.

61. You are troubleshooting a computer that can't communicate with other computers on the network. An ipconfig shows an APIPA IP address (169.254.21.184). What is the most likely problem?

- Answer: C Explanation: The most likely issue is a DHCP failure. Link-local IP addresses such as APIPA on 169.254.0.0 usually kick in when the client computer cannot locate a DHCP server. There are several possible reasons why this might happen: lack of network connectivity, incorrect client configuration, DHCP server failure, and so on. The best way to troubleshoot this situation would be to start at the client and check its network cable (or wireless connection) and then its TCP/IP configuration. You could also try configuring a static IP address on the client to see if it allows the client to communicate over the network. If those things don't solve the problem or give you any clues, you can look at the network switch, DHCP server, and so on.

62. Which of the following is the first thing you should check when a computer cannot get on the Internet?

- Answer: C Explanation: The simplest solution is often the most common. Check cables and see whether the power is on for your devices and computers.

63. You just built a PC, and when it first boots, you hear some beep codes. If you don't have the codes memorized, which of the following are the best devices to examine first? (Select the two best answers.)

- Answers: A and C Explanation: It is common to have an unseated RAM stick or video card. These are the most common culprits of beep codes during the POST.

64. Which of the following are examples of virtual printing? (Select the two best answers.)

- Answers: B and D Explanation: Two examples of virtual printing include XPS printing and print to file (one example of which saves the file as a .prn). Other examples include printing to PDF and printing to image.

65. A coworker needs to print to a printer from a laptop running Windows. The printer has a USB and an Ethernet connector. Which of the following is the easiest way to connect the printer to the laptop?

- Answer: C Explanation: Use the USB connector. By far, this is the easiest method. Windows will sense the USB connection and attempt to install the print driver automatically (though you should still install the latest proper driver from the printer manufacturer's website).

66. You have had several support requests for a PC located in a school cafeteria kitchen that is experiencing a problem. You have already reseated the PCIe and PCI cards and replaced the hard drive in the PC. Computers located in the business office or the classrooms have not had the same problem as the computer in the cafeteria. Which of the following is the most likely issue?

- Answer: A Explanation: Excessive heat is the most likely cause of the problem. This could be an unfortunate result of ovens and other equipment. Computers in environments such as these are often prone to dirt collecting inside the CPU fans and other devices inside the case.

67. A user complains that his network interface card (NIC) is not functioning and has no link lights. The weather has been changing drastically over the past few days, and humidity and temperature have been rising and falling every day. Which of the following could be the direct cause of this problem? (Select the best answer.)

- Answer: A Explanation: Thermal expansion and contraction happen when humidity changes quickly. This can lead to what some technicians refer to as "chip creep" or "card creep."

68. Which network type enables high-speed data communication and is the most difficult to eavesdrop on?

- Answer: C Explanation: Fiber-optic networks use fiber-optic cables that have a core of plastic or glass fibers. They are much more difficult to eavesdrop on than any copper cable.

69. Which of the following properties of a heat sink has the greatest effect on heat dissipation?

- Answer: C Explanation: The surface area of the heat sink has the greatest effect on heat dispersion. The more solid the bond between the heat sink and CPU cap, the better the transition of heat out of the CPU. To aid in this transition, you must use thermal compound.

70. You need to set up a server system that will run in a VM. It will have the bulk of the network computers' resources and will supply much of the resources necessary to the client computers that will connect to it. You are also required to set up the client computers. Which two types of systems (server and client) will you be implementing?

- Answer: B Explanation: You will be implementing a virtualization workstation and thin clients. The virtualization workstation will run virtual software that will allow you to install the server software to a virtual machine (VM). This server provides most of the resources for the clients on the network—the thin clients. Thin clients normally have very limited resources of their own and rely on the server (be it a regular or virtual server) for the additional resources they need.

71. Your boss can receive email but can't seem to send email with the installed email client software. Which protocol is not configured properly?

- Answer: A Explanation: The Simple Mail Transfer Protocol (SMTP) is not configured properly. That is the protocol used to send mail.

72. A customer's laptop LCD needs replacement. Which of the following tools should be used to remove the display bezel?

- Answer: D Explanation: Use a plastic shim to open the display or remove the bezel that surrounds it.

73. One of your customers is running Windows on a PC that has a 3.0-GHz CPU, 16-GB RAM, and an integrated video card. The customer tells you that performance is slow when editing video files. Which of the following solutions increases performance on the computer?

- Answer: B Explanation: The only solution listed is to upgrade the video card. This is the only way that computer performance can be increased while editing video files.

74. Which of the following is configured in the UEFI/BIOS? (Select the four best answers.)

- Answers: A, C, D, and F Explanation: The time/date, boot priority (boot sequence), passwords, and Wake-on-LAN (WOL) can all be configured in the UEFI/BIOS.

75. You want to test whether IPv4 and IPv6 are working properly on a computer. Which of the following commands should be issued?

- Answer: C Explanation: To test IPv4, use the command ping 127.0.0.1. To test IPv6, use the command ping ::1.

76. Which of the following measurements is the typical latency of an SATA hard drive?

    - Answer: D Explanation: The typical latency of an SATA magnetic-based hard disk drive is 4.2 ms (milliseconds). When you are dealing with magnetic drives, latency is the delay in time before a particular sector on the platter can be read. It is directly linked to rotational speed. A hard drive with a rotational speed of 7200 RPM has an average latency of 4.2

77. The marketing printer has been used for four years. Which of the following statements represents a best practice for ensuring the printer remains in good working order?

    - Answer: B Explanation: A maintenance kit includes a new fuser assembly, rollers, and more. Installing a maintenance kit is like changing a car's oil (although it isn't done as often).

78. A customer wants users to be able to store additional files in a cloud-based manner when necessary and remove them when they are not needed anymore. What is this known as?

    - Answer: D Explanation: On-demand means that a customer can get access to cloud-based services 24 hours a day, 7 days a week and that the customer can get additional space if needed on a temporary basis. This links with scalability to a certain extent

79. You are troubleshooting a computer that is no longer able to browse the Internet. The user says that the computer worked before he went on vacation. However, now the user is able to navigate the local intranet but cannot connect to any outside sites. You ping a well-known website on the Internet by name, but you receive no replies. Then you ping the website's IP address, and you do receive a reply. Which of the following commands will fix the problem?

    - Answer: A Explanation: You should run ipconfig /flushdns in an attempt to fix the problem. The problem could be that the DNS cache on the client computer is outdated and cannot associate Internet domain names with their corresponding IP addresses. So you run ipconfig /flushdns and potentially ipconfig /registerdns (or computer restart) to fix the problem. That clears the DNS cache of name resolutions and forces the client to request new DNS information from a DNS server either on the Internet or within the company

80. Answer: B Explanation: The thermal design power (TDP) of a CPU is measured in watts. For example, a typical Core i7 CPU might be rated

at 140 watts or less. The less the watt- age rating, the less the computer's cooling system needs to dissipate heat generated by the CPU.

- B. Watts

1. A - Application

2. Penguin - Presentation

3. Said - Session

4. That - Transfer

5. Nobody - Network

6. Drinks - Data Link

7. Pepsi - Physical

8 ———-

9 Core 2 Troy McMillan

9.1 Operating Systems

1. Which of the following is an interface that offers a glass design that includes translucent windows?

   - B. The Aero interface offers a glass design that includes translucent windows. It was new with Windows Vista. The Sidebar is an area of the desktop where gadgets can be placed. Metro is the name of an interface type, and the Start screen is the new opening interface to Windows.

2. Which of the following are mini programs, introduced with Windows Vista, that can be placed on the desktop (Windows 7) or on the Sidebar (Windows Vista)?

   - A. Windows 7 renamed these Windows Desktop Gadgets. Metro apps are a type of application new in Windows, and widgets are an element of a graphical user interface (GUI) that displays information such as temperature. Shims are pieces of software that allow an application to be supported by a system that normally does not support it.

3. Into which tool has the Security Center been rolled in Windows 7?

   - A. Rolled into the Action Center in Windows 7, this interface shows the status of, and allows you to configure, the firewall, Windows Update, virus protection, spyware and unwanted software protection, Internet security settings, UAC, and network access protection.

Control Panel is a holding spot for many tools used in Windows. The Windows Firewall is a built in firewall for Windows systems. Defender is the Windows anti-malware solution.

4. What is the name of the user interface in Windows 8 and 8.1?

   - B. In both Windows and Windows 8.1, the user interface is very different from earlier versions of Windows. The Start menu was removed, and the desktop replaced with a new look called Metro. The Aero interface offers a glass design that includes translucent windows. It was new with Windows Vista. Sidebar is an area of the desktop where gadgets can be placed. Start or the Start screen is a new opening interface to Windows.

5. What is the minimum RAM required for 64-bit Windows 7?

   - D. Windows 7 requires 1 GB for 32-bit and 2 GB for 64-bit Windows 7 Professional.

6. Which version of Windows 7 can be upgraded to Windows 8?

   - D. Only Windows Home Starter can be upgraded to Windows 8.

7. Which Windows command is used to view a listing of the files and folders that exist within a directory, subdirectory, or folder?

   - B. The DIR command is simply used to view a listing of the files and folders that exist within a directory, subdirectory, or folder. The net use command allows for connecting to, removing, and configuring connections to shared resources. The cd command is used to change directories, and the ipconfig command is used to view and change network settings.

8. Which Windows command is used to move to another folder or directory?

   - C. The change directory (cd) command is used to move to another folder or directory. It is used in both Unix and Windows. The dir command is simply used to view a listing of the files and folders that exist within a directory, subdirectory, or folder. The net use command allows for connecting to, removing, and configuring connections to shared resources. The ipconfig command is used to view and change network settings.

9. Which Windows tool shows a list of all installed hardware and lets you add items, remove items, update drivers, and more?

   - A. Device Manager shows a list of all installed hardware and lets you add items, remove items, update drivers, and more. Event Viewer allows for viewing various event logs. The Users And Groups tool is used to create and manage user and group accounts. The Sync

Center is used to manage the synchronization of data between the local device and other location

10. Which Windows tool tracks all events on a particular Windows computer?

- B. Every program and process theoretically could have its own logging utility, but Microsoft has come up with a rather slick utility, Event Viewer, which, through log files, tracks all events on a particular Windows computer. Device Manager shows a list of all installed hardware and lets you add items, remove items, update drivers, and more. The Users And Groups tool is used to create and manage user and group accounts. The Sync Center is used to manage the synchronization of data between the local device and other locations.

11. Which of the following is either the number of bits used to indicate the color of a single pixel, in a bitmapped image or video frame buffer, or the number of bits used for each color component of a single pixel?

- C. Color depth is either the number of bits used to indicate the color of a single pixel, in a bitmapped image or video frame buffer, or the number of bits used for each color component of a single pixel. In Windows 7, this can be set on the Monitor tab of the properties of the adapter. Resolution has to do with the number of pixels (individual points of color) contained on a display monitor. Refresh rate describes how often the device "repaints" the display image. Pixel count is the same thing as resolution.

12. Which of the following is the number of times in a second that a display updates its buffer and is expressed in hertz?

- B. The refresh rate is the number of times in a second that a display updates its buffer and is expressed in Hertz. In Windows 7, the refresh rate is set using a drop-down box just above the setting for color depth. Color depth is either the number of bits used to indicate the color of a single pixel, in a bitmapped image or video frame buffer, or the number of bits used for each color component of a single pixel. In Windows 7, this can be set on the Monitor tab of the properties of the adapter. Resolution has to do with the number of pixels (individual points of color) contained on a display monitor. Pixel count is the same thing as resolution

13. Which of the following should you exceed for good performance?

- A. Minimum RAMA. The minimum of RAM required should be viewed as just that, a minimum. Make sure you have more than required for satisfactory performance. You should not exceed the maximum resolution recommended for a device. Extra disk space will nor improve performance unless the disk is very full. As pixel

94

count is the same as resolution you should not exceed the recommended count either.

14. Which type of installation is most likely to take place in a SOHO?

   - C. Outside of the enterprise most installations occur by using the CD that came with the software or by placing these same files on a USB stick and accessing them from the USB drive. A network installation is when you load installation files over the network. A Remote Installation Service installation is a legacy method no longer supported. An unattended installation is one that uses an answer file to answer the prompts that appear during installation.

15. Which of the following offers a simplified way to set up a home network?

   - C. HomeGroup offers a simplified way to set up a home network. It allows you to share files (including libraries) and prevent changes from being made to those files by those sharing them (unless you give them permission to do so). A peer-to-peer network is the type of network created with a workgroup. A domain is a network with a directory service such as Active Directory. A workgroup is a small collection of computers grouped without a server.

16. Which of the following can be used to connect to a shared printer

   - A. net use can also be used to connect to a shared printer: net use lpt1:
     printername. The net user command is used to add, remove, and make changes to the user accounts on a computer. The robocopy command (Robust File Copy for Windows) is included with Windows 7, Windows 8, Windows 8.1, and Windows 10 and has the big advantage of being able to accept a plethora of specifications and keep NTFS permissions intact in its operations. If you are comfortable with the copy command, learning xcopy shouldn't pose too many problems. It's basically an extension of copy with one notable exception—it's designed to copy directories as well as files.

17. Which of the following is a command-line interface in Linux?

   - A. In Linux, a shell is a command-line interface, of which there are several types. A domain is a network type that includes a directory service. cmd is a command that when executed in the Run box opens the command prompt. A disk operating system (abbreviated DOS) is a computer operating system that can use a disk storage device, such as a floppy disk, hard disk drive, or optical disc.

18. Which of the following provides a quick way to see everything that's currently open on your Mac?

- B. In Apple, Mission Control provides a quick way to see everything that's currently open on your Mac. A shell is simply a command-line interface. A sandbox is an area where a process can be executed without impacting any other processes. Beeker is not a term used when discussing Apple.

9.2   Security

1. Which of the following is a series of two doors with a small room between them?

    - A. A mantrap is a series of two doors with a small room between them. The user is authenticated at the first door and then allowed into the room. At that point, additional verification will occur (such as a guard visually identifying the person), and then the person is allowed through the second door. A trapdoor is a doorway that is usually hidden. A saferoom is a room that is impenetrable from outside, and badgetrap is not a term used when disusing doorway systems.

2. Which of the following physical characteristics is used to identify the user?

    - B. Biometric devices use physical characteristics to identify the user. Such devices are becoming more common in the business environment. Biometric systems include hand scanners, retinal scanners, and, possibly soon, DNA scanners. Hardware tokens are devices that contain security credentials. Smart cards are cards that contain a chip and credentials. Badge readers are devices that read the information on a card and allow or disallow entry.

3. In which filtering is the physical address used?

    - A. As physical addresses are MAC addresses, MAC address filtering is the correct answer. Email filtering is the filtering of email addresses from which one is allowed to receive. IP address filtering is the type of filtering done on a router or firewall, based on IP addresses. URL filtering restricts the URLs that can be reached with the browser.

4. What firewall only passes or blocks traffic to specific addresses based on the type of application?

    - A. A firewall operating as a packet filter passes or blocks traffic to specific addresses based on the type of application. The packet filter doesn't analyze the data of a packet; it decides whether to pass it based on the packet's addressing information. A proxy firewall is one that makes the Internet connection on behalf of the user and can control where the user goes. Stateful firewalls monitor the state of every TCP connection, thus preventing network mapping. A new-generation firewall is one that operates on all levels of the OSI model.

5. Which of the following was created as a first stab at security for wireless devices?

  - D. Wired Equivalent Privacy (WEP) is a standard that was created as a first stab at security for wireless devices. Using WEP-encrypted data to provide data security has always been under scrutiny for not being as secure as initially intended. Wi-Fi Protected Access (WPA) and WPA2 are later methods that cane after WEP. Temporal Key Integrity Protocol is the encryption method used in WPA.

6. Which of the following was used to increase security in WPA?

  - A. WPA was able to increase security by using a Temporal Key Integrity Protocol (TKIP) to scramble encryption keys using a hashing algorithm. Temporal Key Integrity Protocol is the encryption method used in WPA. Advanced Encryption Standard (AES) is the encryption used in WPA2. IPSec is an industry-standard encryption method, and Secure Sockets Layer (SSL) is an encryption method used in many VPNs.

7. Which type of virus covers itself with protective code that stops debuggers or disassemblers from examining critical elements of the virus?

  - C. An armored virus is designed to make itself difficult to detect or analyze. Armored viruses cover themselves with protective code that stops debuggers or disassemblers from examining critical elements of the virus. A companion virus is one that attaches to a file or adopts the name of a file. A macro virus is one that hides in macros, and a multipartite virus is one that has multiple propagation methods.

8. What element of a virus uniquely identifies it?

  - B. A signature is an algorithm or other element of a virus that uniquely identifies it. Because some viruses have the ability to alter their signature, it is crucial that you keep signature files current, whether you choose to manually download them or configure the antivirus engine to do so automatically. An ID is any types of identifying badge or marker. A badge is something worn to provide identification. Marking is not a word typically used when discussing algorithms or attacks.

9. Which of the following is the term used for someone being so close to you when you enter a building that they are able to come in right behind you without needing to use a key, a card, or any other security device?

  - C. Tailgating is the term used for someone being so close to you when you enter a building that they are able to come in right behind you without needing to use a key, a card, or any other security device. Many social-engineering intruders needing physical access to a site

will use this method of gaining entry. Shadowing is when one user monitors another for training. Spoofing is the adoption of another's email address, IP address, or MAC address. Keyriding is not a word typically used when discussing social engineering.

10. Which of the following is the process of masquerading as another user or device?

- B. Spoofing is the process of masquerading as another user or device. It is usually done for the purpose of accessing a resource to which the hacker should not have access or to get through a security device such as a firewall that may be filtering traffic based on source IP address. Shadowing is when one user monitors another for training. Duplication is the creation of a matching object. Masking is not a term used when discussing impersonation.

11. Which Windows group allows members to install most software but keeps them from changing key operating system files?

- A. The Power Users group is not as powerful as the Administrators group. Membership in this group gives read/write permission to the system, allowing members to install most software but keeping them from changing key operating system files. This is a good group for those who need to test software (such as programmers) and junior administrators. The Guest group is used to allow restricted access to the device. The Administrators group allows full access to the device. The rights held by the Users group are a compromise between Admin and Guest.

12. Which NTFS permission is the least required to run a program?

- D. This combines the permissions of Read with those of List Folder Contents and adds the ability to run executables. List Folder Contents allows viewing what items are in a folder. Full Control allows everything, and Read only allows reading documents.D. Write

13. Which of the following passwords is the strongest?

- D. Although length is now considered the most important password security factor, complexity is also a factor, and these examples are all the same length. The password P@ssw0rd contains four character types, the most of any of the options, which increases the strength of the password. Password and pAssword contains only two types of characters. Pa$$word contains three types.

14. What principle should drive the granting of permissions?

- B. When assigning user permissions, follow the principle of least privilege by giving users only the bare minimum they need to do their

job. Separation of duties prescribes that any operation prone to fraud should be broken up into two operations with different users performing each. Job rotation has the same goal but accomplishes it by requiring users to move around from job to job. Open rights is not a term used when discussing permission and rights.

15. Which type of screen lock uses gestures?

    - C. Swipe locks use a gesture or series of gestures, sometimes involving the movement of an icon to open the screen. In some cases, they require only knowledge of the mobile platform in use; they offer no security to the process because no authentication of the user is occurring. Fingerprint locks open when the correct fingerprint is presented. Facial locks require a matching face scan to open. Passcode locks require the configured passcode to unlock.

16. Which method is good for a lost mobile device?

    - A. Remote wipe gives you the ability to delete all content when a device is stolen or lost. Geofencing allows you to restrict use of the device to a geographic area. Screen locks prevent access to the home screen on the device. Segmentation of data is the separation of personal data from enterprise data on a device.

17. Which of the following involves applying a strong magnetic field to initialize the media?

    - A. Degaussing involves applying a strong magnetic field to initialize the media (this is also referred to as disk wiping). This process helps ensure that information doesn't fall into the wrong hands. Incineration is the burning of the storage device. Hammers can be used to destroy the device. Deleting is the least effective way of removing information.

18. Which method of destroying the data on a hard drive is most effective?

    - B. Physically destroying the drive involves rendering the component no longer usable. Incineration is the burning of the storage device. Degaussing involves applying a strong magnetic field to initialize the media (this is also referred to as disk wiping). This process helps ensure that information doesn't fall into the wrong hands. Clearing is a method that still leaves the data recoverable with data forensics. Deleting is the least effective way of removing information.

19. Which of the following was a concept that was designed to make it easier for less knowl- edgeable users to add a new client to the WLAN without manually entering the security information on the client?

- B. Wi-Fi protected setup (WPS) was a concept that was designed to make it easier for less knowledgeable users to add a new client to the WLAN without manually entering the security information on the client. One method involves pushing a button on the AP at the same time a client is attempting to join the network so that the settings are sent to the client. Other methods involve placing the client close to the AP, and near-field communication is used for the process. Service Set identifier (SSID) is the name of the WLAN. Wired Equivalent Privacy (WEP) and Wi-Fi protected Access (WPA) are wireless security protocols.

20. Which of the following should always be changed from the default?

- A. Every wireless AP or wireless router on the market comes with a default SSID. Cisco models use the name tsunami, for example. You should change these defaults and create a new SSID to represent your WLAN. Wi-Fi protected setup (WPS) was a concept that was designed to make it easier for less knowledgeable users to add a new client to the WLAN without manually entering the security information on the client. One method involves pushing a button on the AP at the same time a client is attempting to join the network so that the settings are sent to the client. Other methods involve placing the client close to the AP, and near-field communication is used for the process. Wired Equivalent Privacy (WEP) and Wi-Fi protected Access (WPA) are wireless security protocols.

9.3   Software Troubleshooting

1. Which type of file cannot be copied from another machine if missing or corrupted?

- B. The boot.ini file is specific to the machine. A .dll file is a file type and not a specific file. The ntldr is the file that loads the operating system. Bootmgr is a file in later systems that manages the boot process.

2. Which of the following is not a possible cause of a "no operating system found" message?

- D. If there was a disk with system files in the DVD drive, the system would boot to it. A nonsystem disk, a corrupted or missing boot sector, and an incorrect boot order in the BIOS could all be possible causes.

3. What is external code that changes your Internet Explorer settings?

- B. A browser redirection is one of the most serious security problems. Browser hijacking software is external code that changes your Internet Explorer settings. It may include changing your home page or

adding or removing items from your favorites. A man- in-the-middle attack is when the malicious individual positions himself between two communicating system, receiving all data. A SYN flood is a form of a DoS attack. Fraggle is an attack using UDP packets.

4. Which of the following is not a symptom of malware?

   - A. Malware decreases performance. It can cause Internet connectivity issues, browser redirection, and pop-ups.

5. Which of the following is the first step in malware removal?

   - D. The steps are as follows: 1. Identify and research malware symptoms. 2. Quarantine the infected systems. 3. Disable System Restore (in Windows). 4. Remediate the infected systems. 5. Schedule scans and run updates. 6. Enable System Restore and create a restore point (in Windows). 7. Educate the end user.

6. What Windows service should be disabled before cleaning an infection?

   - B. Although it is recommended that you disable System Restore before cleaning an infection, it is a good idea to create a restore point after an infection is cleaned. This gives you a clean restore point going forward in case the system becomes infected again at some point. Network address translation, the Windows Firewall, and your antivirus should not be disabled.

7. Which of the following does not negatively impact mobile battery life?

   - A. A low brightness setting does not negatively impact battery life. A high setting, however, does. Location services, Bluetooth, and overheating do not negatively affect battery life.

8. Which of the following does not cause overheating of a mobile device?

   - B. While leaving the phone on will run down the battery, it will not alone cause it to overheat. Excessive gaming, using an old battery, and continuous online browsing will cause overheating.

9. Which of the following is not an indication of a security issue with a mobile device?

   - D. On the contrary, evidence of malware or other issues is usually accompanied by very high resource utilization. Unusual loss of power, slow speeds, and a weak signal are all signs of security issues.

10. Which of the following is an indication of a security issue with a mobile device?

    - C. When cameras have been enabled when they weren't previously, it is an indication of compromise. Low resource utilization, a disabled microphone, and authorized use of the device are not symptoms of a security issue.

9.4   Operational Procedures

1. Which of the following is the least important piece of information to record about each device for proper asset inventory?

   - D. While the OS may be important, for warranty issues these other pieces are more important. The make, model, and serial number are all important.

2. Which of the following is false with respect to change management?

   - C. All costs and effects of the methods of implementation should be reviewed prior to formal approval. The other statements are true.

3. What is the process called that ensures all configuration changes are beneficial?

   - A. During the change management process, the relative costs and benefits to the overall organization will be weighed by a change management board or team. Acceptable use is a policy that defines what users can and cannot do. Separation of duties is a concept that says that any operation prone to fraud should be broken into two jobs and assigned to two people. Risk analysis is a process that identifies risk and mitigations.

4. Which of the following ensures an escape from changes that break something?

   - A. During implementation, incremental testing should occur, relying on a predetermined fallback strategy if necessary. A phased deployment is one in which parts of the network are done at a time. While the communication process is important, it is not what allows for an escape. Request control is a process where change requests are managed and approved.

5. If you use incremental backups every day except Monday, when you do a full backup, how many backup tapes will be required if there is a drive failure on Wednesday after the backup has been made?

   - B. Since an incremental backup backs up everything that has changed since the last backup of any type, each day's tape is unique, so you will need the Monday full backup and the incremental tapes from Tuesday and Wednesday.

6. If you use differential backups every day except Monday when you do a full backup, how many backup tapes will be required if there is a drive failure on Wednesday after the backup has been made?

   - C. Since a differential backup backs up everything that has changed since the last full backup, each day's incremental tape contains what

was on the previous day's tape. So, you only need the last differential and the last full backups.

7. Which of the following is not a safe lifting technique to keep in mind?

   - A. Lift with your legs, not your back. When you have to pick something up, bend at the knees, not at the waist. The other options are all safety recommendation.

8. What class of fire extinguisher is used for paper fires?

   - A. A is for wood and paper fires, B is for flammable liquids, C is for electrical fires, and D is for metal fires.

9. Any type of chemical, equipment, or supply that has the potential to harm the environment or people has to have what document associated with it?

   - B. Any type of chemical, equipment, or supply that has the potential to harm the environment or people has to have a material safety data sheet (MSDS) associated with it. These are traditionally created by the manufacturer, and you can obtain them from the manufacturer or from the Environmental Protection Agency. A statement of work (SOW) is a document that indicates the work to be performed. A service level agreement is a document that indicates what is being paid and what the service consists of. A memorandum of understanding (MOU) is a document that indicates the intent of two parties to do something together.

10. What humidity level should be maintained for computing equipment?

    - A. Another preventive measure you can take is to maintain the relative humidity at around 50 percent. Be careful not to increase the humidity too far—to the point where moisture starts to condense on the equipment!

11. Which of the following is the not part of the first response to an incident?

    - A. You never shut down the system until all volatile evidence has been collected. The other options are correct guidelines.

12. Which of the following applies to EU-based organizations that collect or process the personal data of EU residents?

    - C. Beginning on May 25, 2018, the members of the EU began applying the General Data Protection Regulation (GDPR). The GDPR applies to EU-based organizations that collect or process the personal data of EU residents and to organizations outside the EU that monitor behavior or offer goods and services to EU residents. Personally identifiable information (PII) is data like an XSN number that is unique to the individual. Personal health information (PHI)

is confidential medical records. Payment Card Industry/ Data Security Standards (PCI-DSS) is a standard for protecting credit card data.

13. Which of the following is false regarding dealing with customers?

    - B. If you're providing phone support, do the following: Always answer the telephone in a professional manner, announcing the name of the com- pany and yourself. Make a concentrated effort to ascertain the customer's technical level, and communicate at that level, not above or below it. The other options are all valid recommendations.

14. Which of the following should the IT professional do when dealing with customers?

    - A. You should use appropriate professional titles, when applicable, and never take personal calls, use the customers equipment for personal messages, or talk to co-workers while interacting with customers.

15. Which of the following is written in Python?

    - D. A .pyc file is one written in the Python language. Python runs on Windows, Mac OS X, and Linux/Unix. A .vbs file is a Visual Basic file. An SH file is a script programmed for Bash, a type of Unix shell.

16. Which of the following is a number that can be written without a fractional component?

    - A. An integer (from the Latin integer meaning "whole") is a number that can be written without a fractional component (1, 2, 3 but not 1.5, 1.6). A string is a series of characters. Variables are used to store information to be referenced and manipulated in a computer program. A loop is a section of code that goes back to an earlier part of the script.

17. Which of the following is a command-line tool?

    - D. If you don't need access to the graphical interface and you just want to operate at the command line, you have two options, Telnet and SSH. While Telnet works just fine, it transmits all of the data in clear text, which obviously would be security issue. Remote Desktop and screen sharing are graphical concepts, while file sharing is not a command-line utility.

18. Which of the following is the least secure remote access technology?

    - C. While Telnet works just fine, it transmits all of the data in clear text, which obviously would be a security issue. Remote Desktop and screen sharing are graphical concepts that's can be secured, while Secure Shell (SSH) is an encrypted technology.

10   220-1002 Practice Exam A

1. Which of the following are Microsoft operating systems?

   - Answers: A, C, and F Explanation: Windows 8.1, Windows 10 (version 1803), and Windows 7 are all Microsoft operating systems that you should know for the exam. Incorrect Answers: iOS is the operating system Apple uses on its mobile devices. Android is the competitor of iOS and is an open-source operating system used on many other manufacturers' mobile devices. Android is developed from Linux. The original Linux was made for PCs with the goal of being a freely accessible, open-source platform; today it is more commonly found in server form. Okay, that was an easy one...moving on!

2. Which of the following is the default file system used by Windows?

   - Answer: C Explanation: The New Technology File System (NTFS) is the default file system that Windows uses. Incorrect Answers: FAT32 is an older, less desirable file system that offers less functionality and less security and accesses smaller partition sizes. Compact Disc File System (CDFS) is the file system used by an optical disc. exFAT is another file system supported by Windows that works best with flash-based drives (such as USB thumb drives).

3. Where is the Notification Area located in Windows?

   - Answer: C Explanation: The Notification Area is the area toward the bottom right of your screen within the taskbar. It contains the time and any applications (shown as icons) currently running in memory. The System Properties dialog box contains configuration tabs for the computer name and network, hardware, system restore, and more. You can access any of the tabs in that dialog box quickly by going to Run and typing systempropertiescomputername. exe, systempropertiesadvanced.exe, and so on. Incorrect Answers: The System32 folder resides within the Windows folder; it contains the critical Windows system files such as ntoskrnl.exe as well as applications such as cmd.exe. The Start menu gives access to most programs and configurations in Windows.

4. Which of the following is the minimum amount of RAM needed to install a 64-bit version of Windows 10?

   - Answer: C Explanation: Windows 10 64-bit requires a minimum of 2 GB of RAM. Incorrect Answers: The 32-bit version requires 1 GB. The same goes for Windows 8.1. A minimum requirement for older versions of Windows was 512 MB. No doubt, 4 GB will be the minimum for some Windows versions at some point.

5. In Windows, an MMC is blank by default. Which of the following should be added to the MMC to populate it with programs?

- Answer: D Explanation: The MMC (Microsoft Management Console) is a blank shell until you add snap-ins (such as Computer Management or the Performance Monitor) for functionality

6. Which of the following files is the boot loader in Windows?

- A. Winload.exe

7. Which specific tool enables you to create a partition in Windows?

- A. Disk Management

8. Which type of partition should an operating system be installed to?

- Answer: A Explanation: Primary partitions are the first partitions created on a drive. An OS should always be installed to a primary partition, but before you install the OS, you should set the primary partition to active. If you are installing to a new hard drive, Windows will automatically set the partition to active for you. A Master Boot Record (MBR)-based hard drive can have four primary partitions maximum, each with its own drive letter. Incorrect Answers: If you need to subdivide the hard drive further, you can also use an extended partition, which is then broken up into logical drives. A GUID Partition Table (GPT)-based hard drive is not limited to this number; it can have up to 128 primary partitions. Dynamic refers to a dynamic drive; if you want to resize partitions, you have to convert the drive to dynamic in Disk Management. By the way, any drive in Windows that has a drive letter is known as a volume.

9. Which of the following tools enables you to find out how much memory a particular application is using?

- Answer: B Explanation: The Task Manager enables you, via a click of the Processes tab, to view all current running processes and see how much memory each is using. You can open the Task Manager by right-clicking the Taskbar and selecting it, by going to Run and typing taskmgr, by pressing Ctrl+Shift+Esc, or by pressing Ctrl+Alt+Del and selecting Task Manager. Incorrect Answers: Msconfig is a utility in Windows that allows you to enable and disable services and boot Windows in different modes. Chkdsk is a Command Prompt utility that searches for errors and fixes them (with the /F or /R switches). The System Information tool gives a summary of hardware resources, components, and the software environment; you can open it by going to Run and typing msinfo32.

10. Which of the following features is used to both start and stop ser- vices? (Select the two best answers.)

- Answer: A and B Explanation: You can start, stop, and restart services within Computer Management ¿ Services and Applications ¿ Services. From there, right-click the service in question and configure it as you wish. You can also open Services by going to the Run prompt and typing services.msc. The Task Manager can also be used to start and stop services, as well as to analyze the performance of the CPU, RAM, and the networking connections. You can also start and stop services with the net start / net stop and sc start / sc stop commands. Incorrect Answers: Performance Monitor analyzes the computer in much more depth than the Task Manager. The MMC is the Microsoft Management Console, which is the index that can store other console windows such as Computer Management. Among other things, Msconfig is used to enable/disable services, but not to start them.

11. Which of the following user account permissions are needed to install device drivers on Windows?

   - Answer: C Explanation: The administrator is the only account level that can install device drivers. Incorrect Answers: Standard user, and especially guest, accounts cannot install drivers or programs. The Power Users group is an older group from the Windows XP days that was carried over to newer versions of Windows for application compatibility, but it has no real power in those operating systems.

12. Which of the following commands creates a new directory in the Windows Command Prompt?

   - Answer: B Explanation: MD is short for make directory and is the command to use when creating directories in the Command Prompt. Incorrect Answers: CD is change directory. RD is remove directory, and SD, which deals with memory cards, is not a valid command in the Command Prompt.

13. Which of the following commands is entered at the Command Prompt to learn more about the dir command? (Select the two best answers.)

   - Answers: B and C Explanation: To learn more about any command in Windows, open the Command Prompt, type the command and then /?, or type help dir. Incorrect Answers: dir help would attempt to find the file named HELP within the current directory. dir man would most likely result in a "file not found" error. MAN pages are help pages used in Linux and macOS.

14. Which interface is used to launch the ipconfig command?

   - Answer: A Explanation: Use the Command Prompt to launch the command ipconfig. ipconfig is a networking command that displays

the configuration of your network adapter. You can open the Command Prompt in a variety of ways. You can open the default Command Prompt by going to Run and typing cmd.exe. However, many commands require you to open the Command Prompt as an administrator (in elevated mode). To run it as an administrator, locate it in Windows, right-click it, and select Run as Administrator. Or, you could type cmd in the search field and then press Ctrl+Shift+Enter. You can also locate it in Windows 10 or 8.1 by right-clicking the Start button. Incorrect Answers: The other tools are used in the GUI and cannot run commands such as ipconfig. Use the Command Prompt or the PowerShell to run commands in Windows.

15. A customer's computer is using FAT32. Which file system can you upgrade it to when using the convert command?

    •

16. Which of the following can be used to keep hard drives free of errors and ensure that Windows runs efficiently? (Select the two best answers.)

    • B. Disk Defragmenter C. Check Disk

17. What is Windows Recovery Environment known as? (Select the two best answers.)

    • A. WinRE D. System Recovery Options

18. Which log file contains information about Windows setup errors?

    • B. setuperr.log

19. Which of the following represents the RAM limitation of Windows 8.1 Pro 64-bit?

    • C 512GB

20. A customer's Device Manager shows an arrow pointing down over one of the devices. What does this tell you?

    • Answer: C Explanation: The arrow pointing down tells you that the device is disabled in Windows. In many cases, you can easily enable it by right-clicking and selecting En

21. Which of the following is not an advantage of NTFS over FAT32?

    • Answer: D Explanation: NTFS and FAT32 support the same number of file formats. This is actually the only listed similarity between the t

22. A coworker just installed a second hard drive in his Windows com- puter. However, he does not see the drive in Explorer. What did he forget to do? (Select the three best answers.)

108

- Answers: A, B, and D Explanation: For secondary drives, you must go to Disk Management and initialize, partition, and format them. Explorer in the question could mean File Explorer (Windows 10) or Windows Explorer (Windows 7

23. How would you create a restore point in Windows?

   - Answer: C Explanation: System Restore is the tool used to create restore points. In all versions of Windows, you can find it with the Search utility or by going to the Control Panel ¿ All Control Panel Icons ¿ System, and then clicking the System Protection link. (Or, go to Run and type systempropertiesprotection.exe.) In Windows 7, you can find it in Start ¿ All Programs ¿ Accessories ¿ System Tools as well.

24. Which of the following tasks cannot be performed from the Printer Properties screen?

   - Answer: C Explanation: To pause printing in general and pause individual documents, double-click on the printer in question and make the modifications from the ensuing window.

25. You are setting up auditing on a Windows computer. If it's set up properly, which of the following logs should contain entries?

   - Answer: C Explanation: After Auditing is turned on and specific resources are configured for auditing, you need to check the Event Viewer's Security log for the entries. These could be successful logons or misfired attempts at deleting files; there are literally hundreds of option

26. Which type of virus propagates itself by tunneling through the Internet and networks?

   - Answer: D Explanation: Worms travel through the Internet and through local-area networks (LANs). They are similar to viruses but differ in that they self-replicate

27. Which component of Windows enables users to perform common tasks as non administrators and, when necessary, as administrators without having to switch users, log off, or use Run As?

   - Answer: B Explanation: With User Account Control (UAC) enabled, users perform common tasks as nonadministrators and, when necessary, as administrators without having to switch users, log off, or use Run As. If the user is logged in as an administrator, a pop-up window will appear verifying that the user has administrative privileges before action is taken; the user need only click Yes. If the user is not logged on as an administrator, clicking Yes will cause Windows to prompt the user for an administrative username and pas

28. Which of the following tasks can be performed to secure your WAP/router? (Select all that apply.)

- Answers: A, B, and D Explanation: A multifunction network device that acts as both a wireless access point (WAP) and a router may come with a standard, default SSID name (that everyone knows). It is a good idea to change it (if the router doesn't ask you to do so auto-matically). After PCs and laptops have been associated with the wireless network, turn off SSID broadcasting so that no one else can find your WAP (with normal means). Disabling DHCP and instead using static IP addresses removes one of the types of packets that are broadcast from the WAP, making it more difficult to hack, but of course less functional and useful. Other ways to secure the wireless access point include changing the password; incorporating strong encryption such as Wi-Fi Protected Access version 2 (WPA2) with Advanced Encryption Standard (AES); dis-abling WPS; and initiating MAC filtering, which only allows the computers with the MAC addresses you specify access to the wireless network.

29. When you connect to a website to make a purchase by credit card, you want to make sure the website is secure. Which of the follow- ing statements best describes how to determine whether a site is secure? (Select the two best answers.)

- Answers: A and D Explanation: Although it could possibly be spoofed, the padlock in the locked posi-tion gives you a certain level of assur-ance and tells you that the website is using a secure certificate to protect your session. This padlock could be in different locations depending on the web browser used. Hypertext Transfer Protocol Secure (HTTPS) also defines that the session is using either the Se-cure Sockets Layer (SSL) protocol or the Transport Layer Security (TLS) protocol. Incorrect Answers: HTTP by itself is enough for reg-ular web sessions when you read documents and so on, but HTTPS is required when you log in to a site, purchase items, or do online banking. HTTPS opens a secure channel on port 443 as opposed to the default, insecure HTTP port 80. To be sure that you have a secure session, you can analyze the certificate and verify it against the certificate auth

30. Which type of software helps protect against viruses that are attached to email?

- Answer: B Explanation: Antivirus software (from vendors such as McAfee or Symantec) updates automatically to protect you against the latest viruses, whether they are attached to emails or are lying in wait on removable media. You might also choose to use Windows Defender on newer versions of Window

31. Which of the following is an example of social engineering?

    - Answer: A Explanation: Social engineering is the practice of obtaining confidential information by manipulating people. Asking for a username and password over the phone is a type of phishing attack (known as vishin

32. Where are software-based firewalls most commonly implemented?

    - Answer: C Explanation: Software-based firewalls, such as the Windows Defender Firewall, nor-mally run on client computers. Incorrect Answers: It is possible that software-based firewalls will run on servers, especially if the server is acting as a network firewall, but the servers might rely on a hardware-based network firewall or an IDS/IPS solution. Hardware-based firewalls are also found in multi-function network devices. Some people might refer to these devices as routers, but the router functionality is really just one of the roles of the multifunction network device—separate from the firewall role. Plus, higher-end routers for larger networks are usually not combined with firewall functionality. Switches don't employ software firewalls, mainly because they don't use software (for the mos

33. Making data appear as if it is coming from somewhere other than its original source is known as which of the following terms?

    - D. Spoofing

34. A fingerprint reader is known as which type of security technology?

    - A. Biometrics

35. Which of the following is the most secure password?

    - D. Marqu1s_De_S0d_ver_2

36. Which shortcut key combination immediately locks Windows?

    - B. Windows+L

37. Which of the following is the most secure file system in Windows?

    - Answer: C Explanation: NTFS is Windows' New Technology File System. It secures files and fold-ers (and, in fact, the whole partition) much better than the older FAT32 system does.EFS, BitLocker, and NTFS permissions are just a few of the advantages of an NTF-Spartition

38. Which of the following is the most secure for your wireless network?

    - Answer: B Explanation: WPA2 is superior to WPA and WEP and takes much longer to crack (if itis crackable at all). It works best with AES

39. Which of the following terms refers to when people are manipulated into giving access to network resources?

   • Answer: B Explanation: Social engineering is when fraudulent individuals try to get information from users through manipulation.

40. A customer's Windows computer needs a new larger, faster hard drive. Another technician in your company installs the new drive and then formats the old drive before delivering it to you for disposal. How secure is the customer's data?

   • Answer: B Explanation: The data is very insecure. Many tools can recover data from a drive after it is formatted. Some companies will "low-level" format the drive, or sanitize the drive(as opposed to a standard format in Windows, for example) and keep it in storage indefinitely. The organization might go further and use data wiping software; in fact,this might be a policy for the organization. Always check your organization's policies to be sure you are disposing of or recycling hard drives properly.

41. Which of the following offers hardware-based authentication?

   • Answer: B Explanation: Smart cards are actual physical cards that you use as authentica-tion tools. They are sometimes referred to as tokens and have built-in processors. Examples of smart cards include the Personal Identity Verification (PIV) card used by U.S. government employees and the Common Access Card (CAC) used by Department of Defense personnel.

42. Which protocol encrypts transactions through a website?

   • Answer: B Explanation: Secure Sockets Layer (SSL) and the newer Transport Layer Security (TLS) encrypt the transactions through the website. These SSL certificates are often accompanied by the protocol HTTPS.

43. Which of the following is a common local security policy?

   • Answer: B Explanation: Common local security policies include password length, duration, and complexity. Just the use of a password doesn't constitute a password policy. An exam-ple of a password policy would be when an organization mandates that passwords be 15 characters in length with at least 1 capital letter, 1 number, and 1 special character. In Windows you would access Local Security Policy ¿ Security Settings ¿ Account Policies ¿ Password Policy to make changes to these things

44. A coworker downloads a game that ends up stealing information from the computer system. What is this known as?

- Answer: C Explanation: A Trojan is a disguised program that is used to gain access to a computer and either steal information or take control of the computer.

45. Which of the following is an open-source operating system?

- Answer: A Explanation: Android is an open-source OS. It is freely downloadable and can be modi- fied by manufacturers of mobile devices to suit their specific hardware.

46. Where can you obtain applications for mobile devices? (Select the three best answers.)

- Answers: B, C, and D Explanation: Android users download applications (apps) from Google Play. Apple users download apps from the App Store or from within iTunes.

47. You need to locate a mobile device that was stolen. Which technol- ogy can aid in this?

- Answer: A Explanation: The Global Positioning System (GPS) technology (or location services) can be instrumental in locating lost or stolen mobile devices. Many devices have this installed; others rely on geotracking or Wi-Fi hotspot locating techniques. (You are being watched!)

48. Which kinds of data are typically synchronized on a smartphone? (Select the two best answers.)

- Answers: A and C Explanation: Some of the things you might synchronize on a smartphone include con- tacts, email, programs, pictures, music, and videos.

49. Which of the following is the second step of the A+ troubleshoot- ing theor

- Answer: B Explanation: The second step is to establish a theory of probable cause. You are look- ing for the obvious or most probable cause for the problem.

50. You successfully modified the Registry on a customer's PC. Now the customer's system gets onto the Internet normally. Which of the following steps should be performed next?

- Answer: C Explanation: Documentation is the final step in the troubleshooting theory. This helps you better understand and articulate exactly what the problem (and solution) was. If you see this problem in the future, you can consult your documentation for the solu- tion. Plus, others on your team can do the same. In addition, it is common company policy to document all findings as part of a trouble ticket.

51. Buzz gets an error that says "Error log full." Where should you go to clear his error log?

- Answer: D Explanation: The Event Viewer contains the error logs; they are finite in size. You could either clear the log or increase the size of the log.

52. Which of the following tools checks protected system files?

- Answer: D Explanation: System File Checker (SFC) checks protected system files and replaces incorrect versions.

53. After installing a new hard drive on a Windows computer, Len tries to format the drive. Windows does not show the format option in Disk Management. What did Len forget to do first?

- Answer: B Explanation: You must partition the drive before formatting.

54. Which Windows System Recovery Option attempts to automati- cally fix problems?

- Answer: B Explanation: The best answer is Startup repair. Startup repair attempts to fix issues automatically. This is available in the Windows RE System Recovery Options.

55. Which utility enables you to troubleshoot an error with a file such as ntoskrnl.exe?

- Answer: B Explanation: The Event Viewer logs all errors that occur on a system. Particularly, the System log would contain the information useful in troubleshooting this error.

56. A blue screen is most often caused by

- Answer: A Explanation: The most common reason for a BSOD (blue screen of death, otherwise known as a stop error) is driver failure.

57. A technician is installing a program on a Windows computer and the installation fails. Which of the following statements describes the next best step?

- Answer: A Explanation: Run the installer as an administrator. Programs cannot be installed by standard users or guests. You must have administrative rights to do so.

58. Which of the following statements best describes how to apply spray cleaner to a monitor?

- Answer: D Explanation: Spray on a lint-free cloth first, and then wipe the display gently. A lot of companies sell products that are half isopropyl alcohol and half water. You could also make this cleaner yourself. Again, remember to put the solution on a lint-free cloth first.

59. You and a coworker are running network cables above the drop ceiling. The coworker accidentally touches a live AC power line and is thrown off the ladder and onto the ground. He is dazed and can't stand. He is no longer near the AC power line. Which of the follow- ing statements best describes the first step you should take?

- Answer: D Explanation: Because the immediate danger is gone, call 911 right away.

60. A computer you are working on has a lot of dust inside it. Which of the following statements best describes how to clean this?

- Answer: D Explanation: Compressed air is safe. However, you might want to do this outside and vacuum up the leftover residue. Or if you are working inside, use compressed air to blow dust out of the computer while using an antistatic vacuum to suck up the dust at the same time.

61. You are working on a very old printer and it begins to smoke. Which of the following statements best describes the first step you should take?

- Answer: C Explanation: Turning off the printer might not be enough. It might be seriously mal- functioning, so pull the plug. Incorrect Answers: Dialing 911 is not necessary unless a fire has started. Wait at least 15 minutes before opening the printer to see what caused the smoke. Printer power sup- plies can fail just like a PC's power supply can. In fact, a laser printer power supply does more work because it needs to convert for high voltages in the 600-V range. If you have a maintenance contract with a printer company, and the printer is under warranty or contained in the service contract, you could call the maintenance company to fix the problem. Be ready to give a detailed account of exactly what happened. You could tell the printer that it is bad to smoke, but that would be belligerent and would probably show that you have been working too hard. All kidding aside, be ready to disconnect power at a moment's notice.

62. Which of the following statements best describes the recommended method for handling an empty toner cartridge?

- Answer: D Explanation: Recycle toner cartridges according to your company's policies and proce- dures, or according to municipality rules and regulations.

115

63. One of your technicians is on a service call and is dealing with a furious customer who has been shouting loudly. The technician tries but cannot calm down the customer. Which of the following statements best describes the next step the technician should take?

- Answer: C Explanation: The technician should leave the customer site and document the incident. In rare cases, there is no way to calm down the customer, and you might have to leave the site if there is no other alternative. incident.

64. While you are working at a customer site, a friend calls you on your cell phone. Which of the following statements best describes the recommended course of action?

- Answer: A Explanation: While you're on the job site, limit phone calls to only emergencies or calls from your employer about other customers. Incorrect Answers: Taking a personal phone call, texting, or using social media sites while working at a client site is considered unprofessional. Be professional when you're on the job.

65. Which of the following tools is used when setting the computer to boot with the Selective Startup feature?

- Answer: D Explanation: Msconfig enables you to modify the startup selection. You can boot the computer in different modes with Msconfig . You can also enable and disable services.220-1002 Practice Exam A 169 Incorrect Answers: The Task Manager gives you a snapshot of your system's per- formance and allows you to shut down applications (tasks) or processes, even if the application is hanging or frozen. Windows RE is the Windows Recovery Environment, a special repair environment that is used to fix issues in the operating system. From here, you can fix system file issues and repair the boot sector, along with GPT and MBR-related issues. Safe Mode is one of the options in the Startup Settings/Advanced Boot Options menu. It starts the computer with a basic set of drivers so that you can troubleshoot why devices have failed. It is also instrumental when dealing with viruses.

66. Which of the following file extensions is used when saving PowerShell scripts?

- Answer: C Explanation: The .ps1 extension is used for PowerShell files and scripts.

67. You have been given the task of installing a new hard drive on a server for a customer. The customer will be supervising your work. Which of the following questions should you ask the customer first?

- Answer: B Explanation: Always check whether there are backups, and physically inspect and verify the backups before changing out any drives. Making sure that a backup is avail- able is the first order of business.

68. You just upgraded the president's computer's video driver. Now, the Windows 10 system will not boot. Which of the following steps should be taken first?

    - Answer: B Explanation: By rolling back the driver (which is done in the Device Manager) while in Safe Mode, you can go back in time to the old working video driver. Incorrect Answers: The Windows Recovery Environment might help (for example, if you used Startup Settings ¿ Safe Mode, or System Restore), but the WinRE Command Prompt is not the best answer because it is a different tool. Rein- stalling the OS would wipe the partition of the president's data (and probably wipe you of your job). Directory Services Restore mode (al- though listed in the Advanced Startup Options) is only for Windows Server domain controllers.

69. Which tool is used to analyze and diagnose a video card, including its DirectX version?

    - Answer: B Explanation: The DxDiag utility is used to analyze a video card and its DirectX version and to check if drivers are digitally signed. You can access it by going to Run and typ- ing dxdiag .

70. Which of the following statements best describes a common risk when installing Windows drivers that are unsigned?

    - Answer: A Explanation: By installing a driver that is not signed by Microsoft, you are risking instability of the operating system.

71. Which of the following settings must be established when you want to make a secure wireless connection? (Select all that apply.)

    - Answer: C and D Explanation: To make a secure connection, you first need to know the Service Set Identifier (SSID) of the AP and then the encryption being used (for example, WPA or WPA2). The SSID takes care of the "connection" portion, and the encryption takes care of the "secure" portion. After all computers are connected, consider disabling the SSID for increased security. Incorrect Answers: Know- ing the wireless standard being used can help you verify whether your computer is compatible (802.11ac, n, or g), but the brand of access point isn't really helpful.

72. Which Windows utility is used to prepare a drive image for duplication across the network?

- Answer: B Explanation: Sysprep is one of the utilities built into Windows for image deployment over the network. Incorrect Answers: Ghost and Image Clone are third-party offerings. Robocopy copies entire directories (in the same physical order, too). Sysprep preps the system to be moved as an image file.

73. In Windows, when will a computer dump the physical memory

- Answer: D Explanation: If the computer fails and cannot recover, you usually see some type of critical or stop error. At this point, you must restart the computer to get back into the operating system (unless it is configured to do so automatically, which is the default setting in Windows). The reason for the physical dump of memory is for later debug- ging. The physical dump writes the contents of memory (when the computer failed) to a file on the hard drive. Incorrect Answers: Missing drivers do not cause this error, but a failed driver might. If the wrong processor is installed, you can probably not get the system to boot at all. Shutting down the computer improperly just means that the computer recognizes this upon the next reboot and might attempt to automatically fix errors if any occurred.

74. When a person takes control of a session between a server and a client, it is known as which type of attack?

- Answer: C Explanation: Session hijacking occurs when an unwanted mediator takes control of the session between a client and a server (for example, an FTP or HTTP session). An example of this would be a man-in-the-middle (MITM) attack. Incorrect Answers: DDoS is a distributed denial-of-service attack, an attack perpetu- ated by hundreds or thousands of computers in an effort to take down a single server; the computers, individually known as zombies, are often unknowingly part of a botnet. A brute-force attack is an attempt to crack an encryption code or password. Malicious220-1002 Practice Exam A 171 software is any compromising code or software that can damage a computer's files; examples include viruses, spyware, worms, rootkits, ransomware, and Trojans.

75. The message "The Windows Boot Configuration Data File Is Missing Re- quired Information" appears on the screen. Which command can repair this issue?

- Answer: C Explanation: Bootrec /rebuildbcd attempts to rebuild the boot configuration store. Incorrect Answers: Bootrec /fixboot is one of the methods you can try to repair bootmgr.exe in Win- dows. Bootrec /fixmbr rewrites the master boot record in a Windows system that has an MBR-based hard drive (doesn't affect the more common GPT-based drive). boot bcd is where the boot configuration store is located.

76. Which of the following should be performed during a hard drive replacement to best maintain data privacy?

- Answer: A Explanation: The drive should be completely erased with bit-level erasure software. If it is to be disposed of or is to leave the building, it should also be shredded or degaussed (or both.

77. Which tool is used to back up data on the C: drive in Windows 10?

- Answer: D Explanation: The Windows 10 and 8 File History utility (accessible in the Control Panel) enables a user to back up files or the entire PC

78. Which of the following is the minimum processor requirement for Windows 10?

- Answer: B Explanation: Windows 10 (and Windows 8 and Windows 7) requires a minimum pro- cessor frequency of 1 GHz. Incorrect Answers: Windows 10 64-bit requires 32 GB of hard drive space. As of the writing of this book, 2 GHz is not a valid answer for Windows. The minimum RAM requirement for 64-bit versions of Windows is 2 GB.

79. You create an answer file to aid in installing Windows. Which type of installation are you performing? (Select the best answer.)

- Answer: D Explanation: An unattended installation of Windows requires an answer file. This file is normally named unattend.xml. Unattended installations can be done locally or as part of a network installation using Windows Deployment Services (WDS) in Server 2008 or higher.

80. Which of the following utilities can be used to view the startup programs?

- C. Regedit

10.1 Practice Exam B

1. Which of the following statements best describes how to restart the print spooler service?

- Answer: A and D Explanation: In the command line, this service is simply known as Spooler. Type net stop spooler and net start spooler to restart the service. In Computer Management, the Print Spooler service is found in Services and Applications ¿ Services. Or you could open the Run prompt and type services.msc. From there, you can start, stop, pause, resume, or restart services and also set their Startup type to Automatic, Manual, or Disabled.

2. Where is Registry hive data stored?

- Answer: D

$$\backslash\%systemroot\%\backslash System32\backslash Config$$

3. Clinton needs a more secure partition on his hard drive. Currently the only partition on the drive (C:) is formatted as FAT32. He cannot lose the data on the drive but must have a higher level of security, so he is asking you to change the drive to NTFS. Which of the following is the proper syntax for this procedure

   - Answer: C Explanation: The convert command turns a FAT32 drive into an NTFS drive without data loss, allowing for a higher level of data security. The proper syntax is convert volume /FS:NTFS .

4. Tom has a 200GB hard drive partition (known as C:) on a Windows computer. He has 15GB free space on the partition. Which of the following statements best describes how he can defrag the partition?

   - Answer: B Explanation: Use defrag.exe -f . You need to have 15 percent free space on your partition to defrag it in the Disk Defragmenter GUI-based utility. In the scenario, Tom would need 30 GB free on the 200 GB drive. However, you can force a defrag on a partition even if you don't have enough free space by using the -f switch in the command line. (-f may not be necessary in some versions of Windows.)

5. You are utilizing WSUS and are testing new updates on PCs what is this example of?

   - Answer: C Explanation: Patch management is the patching of many systems from a central location. It includes the planning, testing, implementing, and auditing stages. There are various software packages you can use to perform patch management. Windows Server Update Services (WSUS) is an example of Microsoft patch management software. Other Microsoft examples include the System Center Configuration Manager (SCCM) and its predecessor Systems Management Center (SMS), but there are plenty of third-party offerings as well.

6. Which versions of Windows 8 allow for joining domains?

   - Answers: B and D Explanation: Windows 8 Pro and Enterprise allow for the joining of domains.

7. One of your customers reports that there is a large amount of spam in her email inbox. Which of the following statements describes the best course of action to recommend to her?

   - Answer: B Explanation: You should recommend that the user add the senders to the junk email sender list. This blocks those senders'

email addresses (or the entire domain can be blocked). However, this option could take a lot of time; another option is to increase the level of security on the spam filter within the email program. Any further spam can then be sent to the junk email sender list.

8. In Windows, where can devices like the display and hard drives be configured to turn off after a certain amount of time?

   - Answer: A Explanation: To turn off devices after a specified period of time in Windows, access Control Panel ¿ Power Options. Then click Change Plan Settings for the appropriate power plan.

9. Which of the following procedures best describes how to find out which type of connection the printer is using?

   - Answer: D Explanation: On the Ports tab, you can find how the printer is connected to the com- puter. This can be a USB, COM, LPT, or TCP/IP port. You might get to this tab by selecting Properties or Printer Properties, depending on the printer.

10. Your customer is having problems printing from an application. You attempt to send a test page to the printer. Which of the following statements best describes why a test page should be used to troubleshoot the issue?

   - Answer: C Explanation: The test page verifies connectivity and gives you insight as to possible application problems at the computer that is attempting to print. application problems.

11. A user's hard drive seems very slow in its reaction time when opening applications. Which of the following statements best describes the most likely cause of this?

   - Answer: C Explanation: The drive is fragmented. This is why it is very slow in its reaction time. It's also possible that the OS is infected with a virus. You should analyze and defrag- ment the drive and run an AV sweep of the system.

12. Which of the following actions will not secure a functioning computer workstation?

   - Answer: D Explanation: Sanitizing the hard drive does not secure a computer workstation. It does, however, prevent anyone from accessing data on the drive, but it also ensures the computer workstation won't be functional anymore. A data sanitization method is the specific way in which a data destruction program or file shredder overwrites the data on a hard drive or other storage device.

13. Which utility enables you to implement auditing on a single Windows computer?

- Answer: A Explanation: Because there is only one computer, you can implement auditing only locally. This is done with the Local Security Policy. (This policy is not available in all editions of Windows.)

14. Which of the following statements best describes the main function of a device driver?

    - Answer: D Explanation: Device drivers are the connection between the operating system and the device itself. It is a program that makes the interaction between the two run efficiently. It simplifies programming by using high-level application code. The best device driv- ers come from the manufacturer of the device. They are the ones who developed the device, so it stands to reason that their code would be the most thoroughly tested and debugged.

15. Where are restore points stored after they are created?

    - Answer: D Explanation: After a restore point is made, it is stored in the System Volume Information folder. To view this folder, you must log on as an administrator, show hid- den files and folders, and then assign permissions to the account that wants to view that folder. It is located in the root of the volume that the restore point was created for.

16. Which of the following is considered to be government-regulated data?

    - Answer: C Explanation: PII stands for personally identifiable infor- mation. It is regulated by many laws such as the Privacy Act of 1974 and several others, including GDPR and PCI-DSS

17. Which of the following are types of social engineering? (Select the two best answers.)

    - Answers: B and C Explanation: Shoulder surfing and tailgating are both types of social engineering. A shoulder surfer is someone who attempts to view information on a person's desk or display without the person's knowledge.

18. Which of the following is the service that controls the printing of docu- ments in a Windows computer?

    - Answer: D Explanation: The Print Spooler controls the queue and the printing of documents.

19. Which of the following is the best way to ensure that a hard drive is secure for disposal?

    - Answer: A Explanation: Magnetically erase the drive; for example, degauss the drive. Degaussing a drive is an excellent way to remove all traces of data, but only if the drive is elec- tromagnetic! Of

course, physical destruction is better (shredding, pulverizing); and degaussing might be used on top of physical destruction.

20. A month ago, you set up a wireless access point/router for a small business that is a customer of yours. Now, the customer calls and complains that Internet access is getting slower and slower. As you look at the WAP/router, you notice that it was reset at some point and is now set for open access. You then guess that neighboring companies are using the service connection. Which of the following statements best describes how you can restrict access to your customer's wireless connection? (Select the two best answers.)

   - Answers: A and C Explanation: If the WAP/router was reset, any security settings that you originally set up are most likely gone. If you backed up the settings previously, you could restore them. Either way, some type of encryption protocol (preferably WPA2) is necessary. The passphrase or network key generated by the WAP/router needs to be installed on each client before it can be recognized on the network. This passphrase/key should be kept secret, of course. After all the clients have been associated with the WAP/router, disable SSID broadcasting so that no one else can "see" the router (without more advanced software).

21. A first-level help desk support technician receives a call from a customer and works with the customer for several minutes to resolve the call, but the technician is unsuccessful. Which of the following steps should the technician perform next?

   - Answer: B Explanation: The tech should escalate the call to another technician. This is exactly why help desks are configured in groups: Level 1, Level 2, the masters (Level 3), and possibly beyond. Don't try to be a superhuman. In technology, there is almost always someone who knows more than you about a specific subject. First, route the call to the next-level tech, and then let the customer know that you are doing so.

22. A customer complains that there is nothing showing on the display of his laptop. Which of the following should you attempt first on the computer?

   - Answer: D Explanation: The computer might need a special keystroke, a press of the power but- ton, or just a little more time to come out of Hibernation mode. Remember, check the simple, quick solutions first because they are usually the culprits.

23. During an installation of Windows, you are given an opportunity to load alternative third-party drivers. Which device are you most likely loading drivers for?

- Answer: B Explanation: The SCSI hard drive is the most likely answer. SCSI hard drives (such as SAS SCSI) and RAID controllers need special drivers during the Windows installation process if they are not recognized automatically. Click the option for loading third-party drivers when the installation begins.

24. A Windows 10 computer in a Windows workgroup can have how many concurrent connections?

- Answer: C Explanation: A Windows 10 computer in a Windows workgroup can have 20 maximum concurrent connections to it over the network.

25. Megan's laptop runs perfectly when she is at work, but when she takes it on the road, it cannot get on the Internet. Internally, the company uses static IP addresses for all computers. What should you do to fix the problem?

- Answer: D Explanation: The issue is that Megan needs to obtain an IP address through DHCP when on the road. But setting the network adapter to obtain an IP address auto- matically is not enough. To connect to the internal company network, the Alternate Configuration tab must be configured as a "User Configured" static IP address. This solution enables Megan to connect to networks while on the road by obtaining IP addresses automatically and allows her to connect to the internal company network with the static IP address.

26. Which power-saving mode enables for the best power savings, while still allowing the session to be reactivated later?

- Answer: C Explanation: Hibernate mode saves all the contents of RAM (as hiberfil.sys in the root of C:) and then shuts down the system so that it is using virtually no power. To reacti- vate the system, you must press the power button. At that point, the entire session is loaded from RAM, and you can continue on with the session.

27. John's computer has two hard drives, each 1 TB. The first is the system drive and is formatted as NTFS. The second is the data drive and is formatted as FAT32. Which of the following statements are true? (Select the two best answers.)

- Answers: A and D Explanation: NTFS can use NTFS file-level se- curity, whereas FAT32 cannot. NTFS clus- ter sizes are smaller than FAT32 clusters. NTFS partitions are therefore more efficient (when installed correctly) than FAT32 partitions.

28. When using the command line, a switch

- Answer: D Explanation: A switch (aka option) alters the action of the command but not by forcing it to perform unrelated actions.

29. You need to view any application errors that have occurred today. Which tool should be used?

- Answer: A Explanation: The Event Viewer contains the log files of all the errors that occur on the machine. In this case, you would go to the Application log. Another common log is the System log, which shows errors concerning the OS and drivers.

30. Which of the following commands can help you modify the startup environment?

- Answer: A Explanation: The msconfig utility enables you to modify the startup environment via the General, Boot, and Startup tabs (in Windows 7), and the General and Boot tabs (in Windows 8 and Windows 10).

31. Which of the following log files references third-party software error messages?

- Answer: C Explanation: The Application log in the Event Viewer displays errors concerning Windows applications as well as third-party applications.

32. Which of the following provides the lowest level of wireless security protection?

- Answer: A Explanation: Disabling the SSID broadcast is a security precaution, but it only keeps out the average user. Any attacker with two bits of knowledge can scan for other things the wireless access point broadcasts.

33. A customer uses an unencrypted wireless network. One of the users has shared a folder for access by any computer. The customer complains that files sometimes appear and disappear from the shared folder. Which of the following statements best describes how to fix the problem? (Select the two best answers.)

- Answers: A and C Explanation: Use WPA or WPA2 on the router (and clients) to deny wardrivers and other stragglers access to the customer's network and, ultimately, any shared folders on the network. Increase the level of NTFS security by changing the permissions in the Security tab of the shared folder.

34. A customer is having difficulties with his hard drive, and the system won't boot. You discover that the operating system has to be reloaded. Which of the following statements best describes how to explain this to the customer?

- Answer: D Explanation: Always explain specifically and exactly what you must do and what the ramifications are. Verify that the customer agrees to the proposed work (in writing).

35. Users in your accounting department are prompted to provide usernames and passwords to access the payroll system. Which type of authentication method is being requested in this scenario?

    - . Answer: B Explanation: The type of authentication method being used here is single-factor. The only factor of authentication is something the users know—usernames and passwords.

36. Which of the following commands makes a duplicate of a file?

    - Answer: B Explanation: Copy is used to make a duplicate of the file in another location

37. Which tool in Windows enables a user to easily see how much memory a particular process uses?

    - Answer: C Explanation: The Task Manager enables a user to see the amount of memory and the percentage of processing power a particular process uses in real time. This can be done on the Processes tab.

38. Windows was installed on a computer with two hard drives: a C: drive and a D: drive. Windows is installed to C:, and it works normally. The user of this computer complains that his applications are drive intensive and that they slow down the computer. Which of the following statements best describes how to resolve the problem?

    - Answer: A Explanation: By moving the paging file (or swap file, aka virtual memory) to the D: drive, you are freeing up C: to deal with those drive-intensive programs.

39. Which of the following tools should be used to protect a computer from electrostatic discharge (ESD) while you are working inside it?

    - Answer: C Explanation: Use an antistatic wrist strap when working inside a computer to protect against electrostatic discharge (ESD). Other ways to prevent ESD include using an anti- static mat, touching the chassis of the case (self-grounding), and using antistatic bags

40. You are running some cable from an office to a computer located in a warehouse. As you are working in the warehouse, a 55-gallon drum falls from a pallet and spills what smells like ammonia. Which of the following statements best describes the first step you should take in your efforts to resolve this problem?

- Answer: C Explanation: If something is immediately hazardous to you, you must leave the area right away.

41. While you are upgrading a customer's server hard drives, you notice looped network cables lying all over the server room floor. Which of the following statements best describes how to resolve this issue?

    - Answer: B Explanation: You need to explain to the customer that there is a safer way. Cable man- agement is very important when it comes to the safety of employees. Trip hazards such as incorrectly routed network cables can have devastating effects on a person.

42. Which of the following statements best describes the recommended solution for a lithium-ion battery that won't hold a charge any longer?

    - Answer: C Explanation: Every municipality has its own way of recycling batteries. They might be collected by the town or county yearly, or perhaps there are other recycling programs that are sponsored by recycling companies. Always call the municipality to find out exactly what to do.

43. Which of the following statements is not assertive communication?

    - Answer: C Explanation: Asking a customer if employees always cause issues is just plain rude; this type of communication should be avoided

44. A customer has a malfunctioning PC, and as you are about to begin repairing it, the customer proceeds to tell you about the problems with the server. Which of the following statements best describes how to respond to the customer?

    - Answer: C Explanation: Ask if the server problem is related to the PC problem. Try to understand the customer before making any judgments about the problems. Make sure it isn't a bigger problem than you realize before making repairs that could be futile. If you find out that it is a separate problem, ask the customer which issue should be resolved first.

45. Which of the following could be described as the chronological paper trail of evidence?

    - Answer: B Explanation: Chain of custody is the chronological paper trail of evidence that may or may not be used in court.

46. Which of the following statements best describes what not to do when moving servers and server racks?

    - Answer: B Explanation: Don't attempt to move heavy objects by yourself. Ask someone to help you.

47. Active communication includes which of the following?

  - Answer: C Explanation: One example of active communication is clarifying a customer's state- ments. For instance, if you are unsure exactly what the customer wants, always clarify the information or repeat it back to the customer so that everyone is on the same page.

48. You are troubleshooting a tablet PC that has a frozen application. You have attempted to end the underlying task of the application but have not succeeded. Which of the following statements best describes the next recommended course of action?

  - Answer: C Explanation: The next attempt you should make (from the listed answers) is a soft reset of the device. Resetting often re- quires pressing a special combination of but- tons. That keypress (hopefully) restarts the device with the RAM cleared. Then you can troubleshoot the problem application further if necessary.

49. Which of the following statements best describes the first course of action to removing malware?

  - Answer: A Explanation: The first step in the malware removal best practices procedure is to iden- tify malware symptoms.

50. You are working on a Windows computer that is performing slowly. Which of the following commands should you use to resolve the problem? (Select the two best answers.)

  - Answers: B and D Explanation: The best listed answers are dism and chkdsk . For a computer that is running slow, try using the chkdsk (check disk) and SFC (system file checker) commands. Then, if those run into problems, try using the dism (Deployment Image Servicing and Management) command. Chkdsk and SFC can repair problems with the drive and with system files. Dism can repair problems with the system image (where SFC will draw information from).

51. A customer reports that an optical drive in a PC is no longer responding. Which of the following statements best describes the first question you should ask the customer?

  - Answer: A Explanation: You should first ask if anything has changed since the optical drive worked properly.

52. A coworker is traveling to Europe and is bringing her desktop computer. She asks you what concerns there might be. Which of the following state- ments best describes how to respond to the customer? (Select the two best answers.)

- Answer: B and D Explanation: Your coworker might need an adapter; otherwise, the plug may not fit in some countries' outlets. Some power supplies have selectors for the United States and Europe (115 and 230 volts). If the wrong voltage is selected, the power supply will not work and the computer will not boot; it can also be a safety concern if the voltage is set incorrectly. Newer power supplies might auto-sense the voltage. If the power sup- ply doesn't have one of those red switches, check the documentation to see if it can switch the voltage automatically.

53. After you remove malware/spyware from a customer's PC for the third time, which of the following steps should be taken next?

   - Answer: C Explanation: Teach the user how to avoid this problem by recommending safe comput- ing practices. The customer will then be more likely to come back to you with other computer problems. 'Nuff said.

54. You are asked to fix a problem with a customer's Active Directory Domain Services domain controller that is outside the scope of your knowledge. Which of the following statements best describes the recommended course of action?

   - Answer: D Explanation: Make sure that the customer has a path toward a solution before dismiss- ing the issue.

55. When you are working on a computer, which of the following should be disconnected to prevent electrical shock? (Select the two best answers.)

   - Answers: C and D Explanation: The power cord carries 120 volts at 15 amps or 20 amps, with all of the obvious danger that such voltage and amperage entails. While normally low voltage, a landline telephone cord carries 80 volts when the phone rings. That and network cables can also be the victims of power surges from central office or networking equipment. It is important to disconnect these before servicing a computer.

56. You are troubleshooting a Windows Server computer that you have little knowledge about. The message on the screen says that there is a "DHCP partner down" error. No other technicians are available to help you, and your manager wants the server fixed ASAP or you are fired. Which of the following statements best describes the recommended course of action? (Select the two best answers.)

   - Answers: A and D Explanation: You should attempt to identify the problem and call Microsoft tech sup- port (or contact them in another manner). The message tells you that the DHCP part- ner is down. This means that there are two DHCP servers, one acting as a failover.

As part of your identification of the problem, you should access the TechNet, for example:

57. Which of the following protects confidential information from being disclosed publicly?

- Answer: A Explanation: The classification of data helps prevent confidential information from being publicly disclosed. Some organizations have a classification scheme for their data, such as normal, secret, and top secret. Policies are implemented to make top secret data the most secure on the network. By classifying data, you are determining who has access to it. This is generally done on a need-to-know basis.

58. Programs that run when Windows starts are stored in which of the following registry hives?

- Explanation: HKEY_LOCAL_MACHINE is the Registry hive that stores information about the programs Windows runs when it starts

59. Typically, which of the following Windows tools enables you to configure a SOHO router?

- Answer: D Explanation: The first thing you need to supply is the driver for any special drives, such as new SCSI drives, SAS drives, or RAID controllers. That, of course, is optional. If you have a typical SATA drive, Windows should recognize it automatically.

60. Which of the following steps is performed first when running a clean install of Windows on a brand new SAS hard drive?

- Answer: D Explanation: The first thing you need to supply is the driver for any special drives, such as new SCSI drives, SAS drives, or RAID controllers. That, of course, is optional. If you have a typical SATA drive, Windows should recognize it automatically.

61. A coworker maps a network drive for a user, but after rebooting, the drive is not seen within Explorer. Which of the following steps should be taken first to ensure that the drive remains mapped?

- Answer: A Explanation: Although Windows has the Reconnect at Sign In check box selected by default, it could have been disabled.

62. Based on the physical hardware address of the client's network device, which of the following is commonly used to restrict access to a network?

- Answer: C Explanation: MAC filtering is used to restrict computers from connecting to a network; it is based on the physical Media Access Control (MAC) address of the computer's net- work adapter. It works with wired or wireless connections.

63. A print job fails to leave the print queue. Which of the following services may need to be restarted?

- Answer: B Explanation: The Print Spooler needs to be restarted on the computer that started the print job or the computer that controls the printer. This can be done in the Services console window or in the Command Prompt with the net stop spooler and net start spooler commands, or anywhere else that services can be started and stopped, such as the Task Manager.

64. After installing a network application on a computer running Windows 10, the application does not communicate with the server. Which of the following actions should be taken first?

- Answer: C Explanation: Adding the port number and name of service to the Windows Defender Firewall Exceptions list is the correct answer. But I'm going to pontificate more, as I usually do.

65. A customer reports a problem with a PC located in the same room as cement testing equipment. The room appears to have adequate cooling. The PC will boot up but locks up after 5–10 minutes of use. After a lockup, it will not reboot immediately. Which the following statements best describes the most likely problem?

- Answer: B Explanation: The PC air intakes are probably clogged with cement dust. This stops fresh, cool air from entering the PC and causes the CPU to overheat. That's why the system doesn't reboot immediately; the CPU needs some time to cool down. You should install a filter in front of the PC air intake and instruct the customer to clean the filter often. While you are working on the computer, you should clean out the inside of the system and vacuum out the exhaust of the power supply (without opening the power supply, of course).

66. One of your Windows users is trying to install a local printer and is unsuccessful based on the permissions for the user account. Which of the following types best describes this user account?

- Answer: C Explanation: The Guest account is the most likely answer here. This account has the fewest privileges of all Windows accounts. It cannot install printers or printer drivers. By the way, Standard users can also have issues with printers depending on the ver- sion of Windows and the policies involved. But the Guest has absolutely no administra- tive powers whatsoever.

67. When accessing an NTFS shared resource, which of the following are required? (Select the two best answers.)

- Answers: B and D Explanation: The share-level permissions must first be set to enable access to the user. Then the NTFS file-level "user" permissions must also be set; the most restrictive of the two will take precedence (usually this is configured as NTFS being more restrictive).

68. You are contracted to recover data from a laptop. In which two locations might you find irreplaceable, valuable data? (Select the two best answers.)

    - Answers: C and D Explanation: Pictures and email are possibly valuable, and definitely irreplaceable, if there is no backup.

69. Which utility enables auditing at the local level?

    - Answer: B Explanation: Of all the answers, the only one that deals with the local level is Local Security Policy.

70. A customer has forgotten his password. He can no longer access his company email address. Which of the following statements best describes the recommended course of action?

    - Answer: B Explanation: In many cases, passwords cannot be reset by the user or by the systems admin. If that is the case, you need to verify the identity of the person first. You might need to do so just as a matter of organizational policy

71. Which of the following can help locate a lost or stolen mobile device?

    - Answer: C Explanation: GPS can help to locate a stolen or lost mobile device. Plenty of third party programs allow the user to track the device, as long as it is on and has GPS installed and functioning. If the device is off, the program will display the last known good location.

72. Which of the following can be disabled to help prevent access to a wireless network?

    - Answer: B Explanation: To aid in preventing access to a wireless network, disable the SSID. But only do this when all computers have been connected. If more computers need to be connected later, they will have to connect manually, or the SSID will have to be reenabled.

73. Which of the following commands sets the time on a workstation?

    - Answer: A Explanation: If you are just setting the time on the computer, use the time command. Time can also be set in Windows within the Notification Area. This is a bit of a trick question because you are dealing only with local time, not anything network-related. So the rest of the answers are incorrect

74. In Windows, which utility enables you to select and copy characters from any font?

- Answer: D Explanation: The Character Map enables you to copy characters from any font type. To open it, go to Run and type charmap. In Windows 10, go to Start ¿ Windows Accessories ¿ Character Map. In Windows 7, go to Start ¿ All Programs ¿ Accessories ¿ System Tools ¿ Character Map. Otherwise, in any version of Windows, you can locate it simply by searching for it by name.

75. Which of the following can be described as removing the limitations of Apple iOS?

- Answer: B Explanation: Jailbreaking is the process of removing the limitations of an Apple device's iOS. It enables a user to gain root access to the system and download previously unavailable applications, most likely unauthorized by Apple.

76. In Windows, which of the following built-in applets should be used by a technician to enable and manage offline files, view conflicts and partnerships, and ensure locally stored files match those stored on an external device or server?

- Answer: D Explanation: The Sync Center is located within the Control Panel or can be found using the search tool. It allows you to set up synchronization partnerships with external devices and enables you to manage offline files. Sometimes, the individual icons within the Control Panel are referred to as applets.

77. Which language support for representing characters is built into Windows?

- Answer: A Explanation: Unicode is the code used to represent characters among multiple computers' language platforms. It is commonly used in Microsoft Word and other Office programs. For example, to show the logical equivalence symbol, you would type U+2261, then highlight that text, and then press the Alt+X shortcut on the keyboard, which changes the text into the symbol .Unicode works regardless of the language a person is working in.

78. Which of the following is the best source of information about malicious software detected on a computer?

- Answer: B Explanation: New malicious software (malware) is always being created. Because of this, the best place to find information about spyware, a virus, rootkit, ransomware, or other malware is at a place that can be updated often and easily: the anti-malware company's website.

79. You are working for a company as a roaming PC tech and have been assigned work by a network administrator. The admin notifies you that the company is experiencing a DDoS attack. Half a dozen internal Windows PCs are the source of the traffic. The admin gives you the Windows computer names and tells you that they must be scanned and cleaned immediately. Which of the following effects to the PCs should you as a PC technician focus on fixing? (Select the two best answers.)

- Answers: A and D Explanation: The Windows PCs have probably been infected by a worm and have been compromised and turned into zombies (bots). Trojans could also be involved in this scenario. The Windows PCs are probably part of a botnet that includes other computers as well. The botnet is orchestrated by a master computer that initiates the DDoS (distributed denial-of-service) attack. The infections that you as the technician will have to remove include the worm and the zombie program (or script).You might also be informed that the systems need to be isolated, wiped, and re-imaged before they can be used again.

80. You are troubleshooting a networking problem with Windows, and you can't seem to fix it using the typical Windows GUI-based troubleshooting tools or with the Command Prompt. You have identified the problem and established a theory of probable cause. (In fact, you are on your fourth theory.) Which tool should be used to troubleshoot the problem, and in what stage of the troubleshooting process should you do so?

- Answer: D Explanation: Use the Registry Editor (regedit.exe) to try troubleshooting the problem if typical GUI-based and Command Prompt methods have provided no resolution. The Registry Editor allows you to do any configuration necessary in Windows, and using it may be necessary for more complex troubleshooting problems. At this point you are testing the theory to determine cause because you have already identified the problem and established a theory of probable cause. Remember your CompTIA A+ troubleshooting theory from the 220-1001 objectives. I've listed them below.

10.2   Practice Exam C

1. You work as a technician for an organization that has a custom web-based application that is used for the monitoring of networking devices. While using a web browser to access the application, you press F12, and within the js folder, you see the following code:

```
$(function(){
(function())
{
    var selects = $('select[data−toggle="collapse"]')$
```

```
    }
  }$
```

- D. avaScript

2. Viruses have been detected and removed on a customer's computer several times during the course of several weeks. Which of the following methods will best help prevent future occurrences?

    - Answer: D Explanation: Because this situation happens often, you should school the user on safer web browsing habits such as being very careful when clicking on links brought up by search engines, not clicking on pop-up windows, and being conservative about the websites that are accessed. Also, the browser can be updated, add-ons can be installed to the web browser for increased protection, phishing filters can be enabled, and so on.

3. Which of the following sends an invitation by email asking for help?

    - Answer: D Explanation: Connections can be made by sending Remote Assistance invitations by email (Outlook or other email client) or Easy Connect. These invitations could be to ask for help or to offer help. This approach is often implemented in help desk scenarios in which a user invites a technician to take control of his computer so that it can be repaired. It's effectively a virtual service call. The technician doesn't need to come physically to the user's desk but instead connects remotely.

4. When you are performing a clean installation, which of the follow- ing is the default location for the system files of Windows?

    - C. C:WindowsSystem32

5. You are required to set up a remote backup solution for music and photos stored on an Android tablet. The files cannot be stored at any company location. Which technology should be used?

    - Answer: B Explanation: You would use the Google Cloud solution so that files can be backed up to a location outside the company. This backup—or full synchronization method—is great for Android-based smartphones or tablets as well as Google Chromebooks. Several other third-party solutions are available as well.

6. You have been contracted to repair a computer at an organization that has strict rules about information leaving the premises. While troubleshooting the computer, you determine that the computer should be taken offsite to complete the repair. Which of the follow- ing should you do next?

- Answer: C Explanation: You should check the company's policies and procedures first (or inquire with a compliance officer). If there is confidential or proprietary information that should not leave the premises (under normal c

7. You need to copy and paste information from a web page, but you want to remove all formatting so that it can be pasted cleanly into Word. Which program should be used as an intermediary?

    - Answer: C Explanation: Use Notepad. This text-based editor applies virtually no formatting. Text and other information can be copied from a web page, pasted to a Notepad document, and then copied again and pasted into Word; all formatting is removed. Notepad (and third-party tools such as Notepad++) can also be used for scripting and web page development.

8. A computer is responding slowly, and the Windows Task Manager shows that spoolsv.exe is using 95 percent of system resources. Which of the following is most likely the cause of this problem?

    - Answer: D Explanation: The printing subsystem is most likely failing for one of a variety of reasons. The first solution is to terminate spoolsv.exe (which is the Print Spooler service) in the Task Manager or in the Command Prompt with the taskkill command. Then restart the computer. If that approach doesn't work, the system may have to be repaired, restored, or modified in the Registry (which could be an in-depth process). It is also possible that a virus has compromised the system. There are viruses that are also called spoolsv.exe; a quick sweep of the system folders with AV software should uncover this. . . hopefully.

9. Which of the following descriptions classifies the protocol IMAP?

    - Answer: B Explanation: IMAP is the Internet Message Access Protocol, which allows an email client to access email on a remote mail server. Generally, the email client software leaves the messages on the server until the user specifically deletes them. So, the user can selectively download messages. This allows multiple users to manage the same mailbox.

10. From which of the following locations could you disable a hardware component on a laptop in Windows?

    - Answer: A Explanation: Use the Device Manager to disable a component in Windows, regardless of whether it is a laptop or a PC. When you disable a device, a down arrow appears over the icon of the device, next to the name.

11. Which command-line tool in Windows finds all of the unsigned drivers in the computer?

- Answer: A Explanation: The sigverif.exe tool can be used to check for unsigned drivers within your Windows operating system. Unsigned drivers are those that have not been verified by Microsoft. If you receive error messages and are troubleshooting, run this command from the Run prompt. When the check is finished, unsigned drivers are displayed. This list is also stored in a file called sigverif.txt within the

12. Users are reporting to you that a Windows feature asks them for confirmation before running certain applications or when making system changes. What is the name of this Windows feature, and where should you direct users to turn the functionality off?

- Answer: D Explanation: User Account Control (UAC) is the portion of Windows that asks for confirmation of administrative rights before allowing a user to make system changes or run certain applications. It can be disabled within the User Accounts applet within the Control Panel by clicking the Change User Account Control Settings link. But beware; only users who have administrative rights should even be permitted to turn off this setting. UAC can be further configured in the Group Policy Editor and in the Registry Editor. For more information about how UAC works, see the following link:

13. James is a LAN administrator in charge of printers. Which of the following should he check first when a Windows user is trying to print a document and gets the error message "Print sub-system not available"?

- Answer: C Explanation: If a "print sub-system not available" message or similar message appears, it most likely means the spooler has stalled. You can turn it back on within the Services section of Computer Management or by issuing the command net start spooler at the Command Prompt.

14. Your manager's Windows computer locks up after the graphical user interface starts to load. However, the computer will boot in Safe Mode. When you access the Event Viewer, you see an entry stating that a driver failed. Which of the following steps will help you further diagnose the problem?

- Answer: B Explanation: Boot Logging can be enabled from the Windows Recovery Environment (WinRE) in Startup Settings or in the Windows Advanced Boot Options menu. After this option is enabled, the system automatically creates a file called ntbtlog.txt. Afterward, you can access the system by booting into Safe Mode, once again from the recovery environment.

15. Which of the following commands is used to fix errors on the system disk?

- Answer: D Explanation: Chkdsk /F allows you to fix errors on a disk. It does not fix all errors, but it checks for disk integrity, bad sectors, and similar issues.

16. You are troubleshooting a computer that has a web browser issue. The end user says that multiple browser pages open by themselves when surfing the Internet. Also, you observe that the computer is run- ning slowly. Which of the following actions should you perform first?

    - Answer: A Explanation: The first thing you should do is install anti-malware software. It would be surprising if the computer doesn't have any, but it happens.

17. A new program is crashing and causing the computer to lock up. What is the best location to check for further information about the cause of the crash?

    - Answer: C Explanation: The Application log is the location for all events concerning Windows applications and third-party programs.

18. You are tasked with disabling services from starting on a Windows PC. Which command should be run to bring up a window to make these changes?

    - Answer: C Explanation: The Application log is the location for all events concerning Windows applications and third-party programs.

19. In Windows, which of the following folders might be stored in a hidden partition by default?

    - Answer: A Explanation: The Boot folder can be located in a hidden partition (100 MB in size), by default, which is separate from the C: drive.

20. One of your customers has a wireless network that is secured with WEP. The customer wants to improve data encryption so that the transmission of data has less of a chance of being compromised. Which of the following statements best describes the recommend- ed course of action?

    - Answer: A Explanation: The best solution is to upgrade the wireless network from WEP to at least WPA2. WEP is a deprecated wireless encryption protocol and should be updated to a newer and more powerful protocol if at all possible. If this is not possible, it would be wise to use a strong WEP key and modify it often.

21. Which of the following commands is used to display hidden files?

    - Answer: B Explanation: Dir /a can be used to display hidden files. Specifically, dir /ah can be used to show hidden files only.

22. After you install a new video card, the PC loads Windows and continuously reboots. Which of the following statements best describes the first course of action?

- Answer: A Explanation: Try accessing Safe Mode first and see if the problem continues. It probably won't, and you will need to roll back the driver and locate, download, and install the correct one. Remember to get your drivers from the manufacturer's website, and don't forget to download the correct driver for your particular operating system.

23. Which of the following statements best describes how to prepare a mobile device in case it is stolen or lost? (Select the three best answers.)

- Answers: B, D, and F Explanation: First, you should configure some kind of remote backup. This way, if the device is compromised, you have the confidential data backed up outside of the device at another location. The other half of this solution (not mentioned in the answers) is remote wipe. When you are positive that the device is stolen or lost, and you know the data was backed up at some point, trigger a remote wipe to remove all data from the device. Second, enable GPS on the device so that it can be tracked if it is lost or stolen. Third, configure a screenlock of some sort, be it a pattern that is drawn on the display, a PIN, or a password. A strong password is usually the best form of screenlock and the hardest to crack.

24. Two coworkers share the same file inside a folder. User A works on the file, makes changes, and saves the file. User B then works on the file, makes changes, and saves the file as well. The next time User A attempts to open the file, she receives an access denied error. Which of the following statements best describes the most likely cause of this error message?

- Answer: D Explanation: Most likely User B moved the file to another location outside of the current partition, made the changes (which is possible since User B is the one who moved it), and then moved it back to the original location. Whenever a file is moved to another partition or volume, the file takes on the permissions of the parent folder. However, if the file had been moved within the volume, the permissions would have been retained. Tricky. Remember this: If the file is moved within the same volume, it retains permissions, so the permissions don't change. But if a file is moved to another volume, it takes on the permissions of the folder it is moved into. As for copying, the file's copy always takes on the permissions of the parent regardless of where that copy is placed.

25. In Windows, which of the following commands should be used to verify that a previous system shutdown was completed successfully?

- Answer: B Explanation: Chkntfs can check to see whether a previous system shutdown completed successfully. This command must be run in elevated mode to function properly. Generally, you would check this on the system drive (for example, C:). If the drive is okay and the system did complete the shutdown successfully, you'll get a message such as "C: is not dirty." Otherwise, you'll get a message telling of the error.

26. Which of the following are the best answers for securing a data center? (Select the two best answers.)

- Answers: B and E Explanation: The badge reader and biometric lock are the best of the listed answers (although all kinds of other security methods are possible). This scenario is an example of multifactor authentication (MFA). An RFID-based badge reader relies on something a person has, and the biometric lock system relies on something the user is. MFA systems are more secure because they layer the security.

27. Which of the following is the best Windows utility to use if an administrator wants to perform administrative tasks that integrate scripts over a network?

- Answer: A Explanation: The Windows PowerShell is the best of the listed Windows utilities that enables administrators to perform administrative tasks that integrate scripts and executables and can be run over a network. For even more power and flexibility, use the PowerShell Integrated Scripting Environment (PowerShell ISE).

28. Which of the following can be used to kill a running process?

- Answer: A Explanation: The Task Manager can end (or "kill") a running process. It is also used to end applications that lock up, and it analyzes the performance of the system.

29. Which of the following file systems is suited specifically for USB flash drives?

- Answer: B Explanation: exFAT (also known as FAT64) is suited specifically for USB flash drives and many other mobile storage solutions. It is the successor to FAT32 and can format media that is larger than 32 GB with a single partition.

30. A program has been detected collecting information such as the computer name and IP address and sending that information to a specific IP address on the Internet. Which kind of threat is this an example of?

- Answer: A Explanation: Spyware is a type of malicious software that is usually downloaded unwittingly by a user or is installed by third-party software. It collects information about the user and the user's computer without the user's consent.

31. You are required to stop the Windows Defender Firewall service. Which of the following best describes how to accomplish this? (Select the three best answers.)

- Answers: B, D, and G Explanation: You can stop a service in a variety of ways. The easiest and most common is to go to the Services console window. You can do this by typing services. msc at the Run prompt. You can also stop services in the Task Manager by accessing the Services tab and right-clicking the service in question. But in the Task Manager you have to know the executable name of the service. The name of the Windows Firewall service is mpssvc. So, the third way (of the listed answers) is to use the net stop mpssvc command in the Command Prompt.

32. You spill a chemical on your hands. It does not appear to be life threatening. Which of the following statements best describes the recommended course of action?

- Answer: C Explanation: If the chemical spill is not life threatening, consult the material safety data sheet (MSDS) to determine the proper first aid (if any).

33. Which command allows a user to change a file's permissions in Linux?

- Answer: D Explanation: The chmod command allows a user to modify file and folder permissions at the Linux command line.

34. While you are working on a computer at a customer's home, the customer informs you that he needs to leave for about 10 minutes and that his eight-year-old son can help you with anything if you need it. Which of the following statements best describes the recommended course of action??

- Answer: C Explanation: Whenever you're working in someone's home, make sure that an adult is available. you work.

35. You want a cloud provider that will offer you service which is quickly scalable. Which of the following should be requested when you contact potential cloud providers?

- Answer: B Explanation: Rapid elasticity means that the service can be scalable at need and can grow in real time with your company's growth.

36. You have been asked to recommend an anti-malware program for a home user. However, the user does not want to pay for a license. Which of the following should you suggest?

- Answer: C Explanation: An open license means that the software can be downloaded and used for free.

37. A customer experiences a server crash. When you arrive, the manager is upset about this problem. Which of the following statements best describes the recommended course of action?

- Answer: A Explanation: Stay calm and do the job as efficiently as possible. There isn't much you can do when a customer is upset except fix the problem.

38. Which type of web server is designed to resolve hostnames to IP addresses?

- Answer: D Explanation: A Domain Name System (DNS) server is designed to translate hostnames (such as dprocomputer.com) to their corresponding IP addresses (for example, 65.18.242.1).

39. As you are servicing a manager's PC at your company, you run across a list of names of employees who are supposedly about to be let go from the company. Some of these people are coworkers. Which of the following statements best describes the recommended course of action?B. Act as if you never saw the list.

- Answer: B Explanation: There isn't much you can do in a situation like this, especially if you already saw what was printed on the document. The best thing is to ignore it and act as if it never happened. It's not your place to take action based on a document that is lying around. Without intense scrutiny, it is hard to know exactly what a document is. The purported list might be real, but it might not be. It isn't your call to make. However, before working at a customer site, you should ask that all confidential materials be removed before you begin work. If something is left out in plain sight, you could let a manager know that there could be confidential data lying around.

40. Which macOS utility is most like Windows' "end task" feature?

- Answer: D Explanation: The force quit option in Apple's macOS is most like the "end task" feature in the Windows Task Manager. It helps when an application is not functioning as intended and is either frozen or intermittently slows down the system.

41. Which of the following statements best describes how to reduce the chance of ESD? (Select the three best answers.)

- Answers: A, B, and D Explanation: To reduce the chance of electrostatic discharge (ESD), use an antistatic wrist strap and mat. If connected properly, they become suitable methods of selfgrounding. Also, consider raising the humidity. The more humidity there is, the less friction, and ultimately, less ESD.

42. While you explain a technical concept to a customer, which of the following statements best describes the recommended course of action?

- Answer: B Explanation: Make the customer truly feel comfortable by sitting down next to her and taking the time to explain the technical concept from a simple and concise point of view. The less jargon, the better.

43. You are viewing the contents of an ipconfig /all on a Windows computer. You see the name dpro42.com toward the beginning of the results. Which type of network is this Windows computer most likely a part of?

    - Answer: C Explanation: If you see the name dpro42.com toward the beginning of the results of an ipconfig /all command, the computer is most likely a part of the dpro42.com domain. This would be listed in the Primary DNS Suffix entry, which is usually directly after the Host Name entry. The .com is the giveaway. Some kind of DNS extension (such as .com or .net) is necessary when you have a domain

44. Which of the following should be used to clean a monitor's screen when you are not sure how to do so?

    - Answer: C Explanation: If you are not sure about what to clean a screen with, use water. Water will most likely not damage the screen.

45. You are required to register an ActiveX control in the Command Prompt. Which utility should be used?

    - Answer: A Explanation: The regsvr32 command is used to register and unregister ActiveX controls and Dynamic-Link Libraries (DLLs). For example, to register the Sample ActiveX control, you would type regsvr32 sample.ocx.

46. As part of the risk management of your company, you have been tasked with backing up three physical servers on a daily basis. These backups will be stored to a NAS device on the LAN. Which of the following can you do to make sure the backup will work if needed?

    - Answer: A Explanation: The best option here is to create alerts to let any and all administrators know if a backup failure occurs. These alerts would either be created at the network attached storage (NAS) device or at the individual servers to be backed up. If an admin receives an alert, that person will know to either rerun the backup or (more likely) fix the backup task and then run it. One of the issues here is that you might not know if a backup fails—without the alerts, that is.

47. You have an Intel Core i7 system with a UEFI-enabled motherboard. Which of the following types of hard drive partitioning schemes should be selected when installing Windows?

- Answer: D Explanation: If your system's motherboard is equipped with a UEFI BIOS, you should definitely take advantage of the GUID Partitioning Table (GPT). It is superior to Master Boot Record (MBR) technology. It allows for up to 128 partitions, is not limited to the 2-TB maximum partition size of MBR, and stores multiple copies of itself on the system.

48. Which of the following statements best describes the recommended course of action to take prior to attempting to remediate infected Windows systems of malware?

    - Answer: B Explanation: You should disable System Restore on Windows systems just before attempting to remediate the system of malware. This is step 3 of the CompTIA A+ best practices/procedure for malware removal. The entire procedure is as follows:

49. A customer's mobile device cannot connect to Wi-Fi. According to the customer, it was working fine yesterday. Troubleshoot! Which of the following statements best describes the recommended course of action? (Select the three best answers.)

    - Answers: A, D, and E Explanation: If a mobile device cannot connect to the network, you should attempt to power cycle the device, forget and reconnect to the Wi-Fi network, and check if the correct SSID was entered in the first place. Perhaps the #1 method would be to power cycle Wi-Fi (not listed in the answers).

50. Which of the following utilities enables a Windows user to edit a file offline and then automatically update the changes when the user returns to the office?

    - Answer: A Explanation: The Sync Center is a Windows feature that enables you to keep information synchronized between your computer and network servers. You can still access the files and modify them even if you don't have physical access to the server; in this case they are modified "offline" and are synchronized automatically when you return to the network. Some mobile devices are also compatible with Sync Center. The Sync Center can be configured within the Control Panel.

51. A help desk phone support technician is finding it difficult to understand the customer due to a heavy accent. Which of the following statements best describes the first course of action the technician should take to help the customer resolve the problem?

    - Answer: A Explanation: The technician should repeat the problem back to the customer to make sure that everyone is talking about the same thing and that both parties understand each other. Always clarify.

52. Which of the following relies on PPTP to create a secure tunnel?

   • Answer: C Explanation: Virtual private networks (VPNs) rely on a tunneling protocol such as Point-to-Point Tunneling Protocol (PPTP) or Layer 2 Tunneling Protocol (L2TP) to create a secure connection between a network and a remote computer or group of computers. The preferred method for Windows clients is to use Internet Key Exchange version 2 (IKEv2). You might also make use of a RADIUS server for authentication or use an always-on VPN solution such as OpenVPN.

53. Which of the following will occur if temp is executed from Run?

   • Answer: C Explanation: Entering

54. Which group is best to assign to a home user to prevent software installation?

   • Answer: D Explanation: The standard user cannot install software or make changes to the system without knowing an administrative login.

55. A Windows PC is not booting correctly. You need to locate bad sectors and recover information. Which command is best?

   • Answer: A Explanation: Chkdsk /R locates bad sectors and recovers the information from them.

56. One of your coworkers has a smartphone that contains PII. Because the data is required for use and is valuable, the coworker cannot have the phone automatically wiped if it is lost or stolen. Which of the following is the best way to secure the device?

   • Answer: D Explanation: Of the listed answers, a fingerprint is the best way to secure the smartphone. If the smartphone is lost or stolen, another person would have a difficult time unlocking the device (though not impossible). For a device that cannot be remote wiped (for various reasons), the best alternatives are the use of biometric authentication, in combination with a strong password (for MFA); plus encryption.

57. Where can a user's Desktop folder be found in Windows by default?

   • Answer: A Explanation: Every user profile gets a Desktop folder by default. This folder is located within the user profile folder, which is shown in the answer as a variable

58. A user who is part of a workgroup reports that she cannot print to a new printer. Everyone else in the workgroup can print to the new printer, and the user can still automatically send print jobs to the old printer. Which

of the following statements describes how to remedy the problem? (Select the two best answers.)

- Answers: A and D Explanation: If a user cannot print to a brand-new printer, yet everyone else can print to it, you should check whether the printer is installed on that user's computer and if it is set as the default printer.

59. Your organization has an Active Directory domain. One of the users, Bill, should not have read access to a folder named Accounting. The Accounting folder is shared on a network server, on a partition formatted as NTFS. Which of the following statements best describes how to stop Bill from having read access to the folder without impacting any other users on the network?

- Answer: D Explanation: The best option in this scenario would be to deny read access to the Accounting folder for Bill through shared access security.

60. Examine the following figures

- Answer: B Explanation: The Disk Management component of Computer Management is displayed in the figure. You can tell because it shows each disk and the volumes within each disk.

61. Which of the following the best Windows utility to back up important sytem settings without requiring external storage?

- Answer: C Explanation: System Protection is a feature that creates and saves data about the computer's system files and settings. It does this by creating restore points. You access it by going to the System Properties dialog box and clicking the System Protection tab. External storage is not necessary for these restore points; they are automatically stored in the system volume.

62. Your boss wants to encrypt a hard drive that will store critical data. Your boss needs to be able to drag and drop folders onto the volume and have them encrypted in real time. Which encryption techniques should you suggests?

- Answer: A Explanation: BitLocker is a type of whole-disk encryption, or WDE. It encrypts all of the contents that are created on it or copied to it in real time. It requires a trusted platform module (TPM) on the motherboard or an encrypted USB flash drive. Only select editions of Windows support BitLocker when used in this manner. Other lesser versions of Windows are compatible with BitLocker To Go for reading encrypted documents from USB flash drives.

63. Your boss asks you to troubleshoot a computer with a virus. Which of the following statements best describes the first step you should take to remedy the problem?

   - Answer: B Explanation: The first thing you should do is identify the malware. (By the way, if the computer is on the network, disconnect it first.) Then you can research that malware and any possible cures by searching the Internet and accessing your AV provider's website.

64. User A is part of the Users Group

   - Answer: A Explanation: User A will end up having the Read Only level of access to the share. Generally, a user gets the more restrictive level of access. The only thing that is different between the share's permissions and the parent directory's permissions is the level of control for the Users group. Normally, a share will obtain its permissions from the parent folder—that is, unless that option is unchecked in the properties of the folder. Then the folder can be reconfigured for whatever permissions an admin wants to set for it. That must be what happened in this scenario.

65. Your boss wants to implement BitLocker on yet a second laptop for traveling purposes. Which of the following should be performed before implementing BitLocker?

   - Answer: A Explanation: Before implementing the BitLocker solution in Windows, you should enable the trusted platform module (TPM) in the BIOS. This is the chip on the motherboard that includes the encryption code.

66. You need to edit a protected .dll file on a Windows 8.1 Pro PC, but you cannot find the file you are looking for in the System32 folder. Which of the following Control Panel utilities should you configure?

   - Answer: D Explanation: Use the Folder Options utility in the Control Panel of Windows 8.1. From there, you go to the View tab and then deselect the check box labeled "Hide protected operating system files (Recommended)." You might also deselect the "Hide extensions for known file types" check box to see which ones are .dll files. Note that this utility was removed from the Windows 10 Control Panel. Instead, you can access it with File Explorer Options or from the File Explorer program by choosing View ¿ Options ¿ Change Folder and Search Options. Or you can go to Run and type control folders.

67. One of your customers has a defective disk. Which command can be used to extract readable information?

   - Answer: A Explanation: The Recover command can recover readable information from a bad or defective disk. The disk should be attached (slaved) to a working computer to get back the data

147

68. You have been asked to load a copy of the company's purchased software on a personal computer. Which of the following statements best describes the first step you should take to remedy the problem?

   • Answer: A Explanation: You should first verify that the installation is allowed under a company's licensing agreement. It probably isn't, but you should check first. Most organizations do not allow purchased software to be installed on an employee's home computer. If doing so is against organization policy, you should notify your supervisor. There are many types of licenses that you should be aware of, including end-user licensing agreements (EULA), digital rights management (DRM), commercial and enterprise licenses (such as client access licenses or CALs), open source versus closed source (that is, Android versus iOS), personal licenses, and so on. Again, be sure to follow and incorporate corporate end-user policies and security best practices when it comes to these types of licenses.

69. Your friend is playing the latest first-person game on a PC, but the screen is pausing during game play. Your friend has a high-end graphics card and the maximum memory for the motherboard. Which of the following statements best describes how to remedy the problem?

   • Answer: A Explanation: If you see video issues such as pausing during game play, upgrade the video drivers. Make sure that you download the latest video driver from the manufacturer's website. Gamers cannot rely on Microsoft drivers.

70. You have been asked to move data from one user's laptop to another user's laptop, each of which has EFS functioning. Which of the following statements best describes the first step you should take to remedy the problem?

   • Answer: B Explanation: The first thing you should do is export the user's certificate from the first laptop to the second laptop. You can do this by clicking Start and typing certmgr. msc in the Search box; then locate and export the correct Personal Certificate. The Certificates console window can also be added to an MMC. The Encrypting File System (EFS) is the standard single-file encryption method for Windows (if the version supports it).

71. Which of the following statements is true?

   • Answer: B Explanation: Authentication can be carried out by utilizing something a user is, such as a fingerprint; something a user knows, such as a password or PIN; something a user has, such as a smart card or token; and something a user does, such as writing a signature or speaking words.

72. You are required to implement an organizational policy that states user passwords can't be used twice in a row. Which of the following policies should be configured?

   - Answer: B Explanation: You should configure the Enforce password history policy and set it to a number higher than zero. This way, when a user is prompted to change her password every 42 days (which is the default minimum password age), that user will not be able to use the same password. Password policies can be accessed in Windows within Local Security Policy window ¿ Security Settings ¿ Account Policies ¿ Password Policy.

73. You are working on a computer in which you just installed a new hard drive. The system already runs Windows. The new hard drive does not appear in Explorer. Which of the following statements best describes the next step you should take to ensure the drive will be recognized by the operating system?

   - Answer: B Explanation: When you add a second drive to a system that already has Windows installed, you will probably have to initialize the drive and format it in the Disk Management utility.

74. An attacker is constantly trying to hack into one of your customer's SOHO networks. Which of the following statements best describes the easiest, most practical way to protect the network from intrusion?

   - Answer: D Explanation: The most practical way to prevent intrusion to the network is to install a firewall. In fact, if this is a SOHO network, chances are the network is controlled by a multifunction network device that already acts as a switch and a router and probably has built-in firewall technology; it just has to be enabled. Usually, these are enabled by default, but perhaps someone inadvertently disabled this feature, and that's one of the reasons an attacker keeps trying to get into the network.

75. One of the administrators recently moved a large chunk of data from one server to another. Now, several users are reporting they cannot access certain data shares and get the following error: Access Denied. The admin confirms that the users are in the proper security groups, but the users are still unable to access the shares. Which of the following are the most likely causes of the problem? (Select the two best answers.)

   - Answers: A and C Explanation: The most likely reasons the users cannot connect are because of denied permissions and mapped drives. If the data was moved to another computer, the folders will inherit new permissions from the parent (by default). That will most likely eliminate the current user access. Also, the path to the share will change (again by default). Either the server name/IP address, the

sharename, or both will be different when the data is moved to another server. So, to fix the problem, the user and group permissions will have to be modified for the new share, and new mapped drives will need to be configured.

76. Which command in the Linux terminal enables you to find out information about a wireless network adapter?

   - Answer: D Explanation: Use iwconfig (or ifconfig) to analyze a wireless network adapter in the Linux terminal. (Note that iwconfig does not work in macOS, but ifconfig does.) Also, as of the writing of this book, the ip a command can be used as well.

77. You have a Windows computer for which you wish to write a batch file. You want the batch file to turn off the computer after a certain amount of time. Which main command should be run in the batch file?

   - D. Shutdown

78. Which switch of the Robocopy command copies subdirectories but skips empty ones?

   - /s copies subdirectories but skips any empty ones

79. Which of the following are components of dealing with prohibited content? (Select the three best answers.)

   - A. C. Preserving data D. Creating a chain of custody

80. You are designing the environmental controls for a server room that contains several servers and other network devices. Which of the following statements best describes the role of an HVAC system in this environment? (Select the two best answers.)

   - C. It provides an appropriate ambient temperature. D.