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CompTIA® A+ 220-801 and 220-802

Approved Practice Questions
Fifth Edition

David L. Prowse

CompTIA® A+ 220-801 and 220-802
Approved Practice Questions
Exam Cram, Fifth Edition

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Table of Contents

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David L. Prowse is an author, a computer network specialist, and a technical trainer. Over the past several years he has authored several titles for Pearson Education, including the well-received *CompTIA A+ Exam Cram* and *CompTIA Security+ Cert Guide*. As a consultant, he installs and secures the latest in computer and networking technology. Over the past decade he has also taught CompTIA A+, Network+, and Security+ certification courses, both in the classroom and via the Internet. He runs the website www.davidlprowse.com, where he gladly answers questions from students and readers.

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Please note that I cannot help you with technical problems related to the topic of this book. We do have a User Services group, however, where I will forward specific technical questions related to the book.

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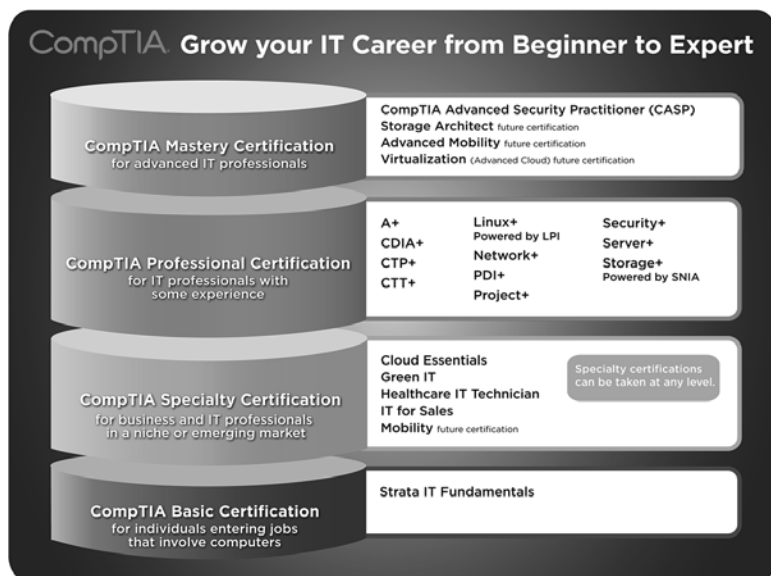
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Introduction

Welcome to *CompTIA A+ 220-801 and 220-802 Practice Questions Exam Cram*. The sole purpose of this book is to provide you with practice questions that are complete with answers and explanations to help you learn, drill, and review for the CompTIA A+ certification exams. The book offers 700 questions that will help you practice each exam domain and will help you assess your knowledge before you take the real exam. The detailed answers to every question will aid in reinforcing your knowledge about the concepts associated with the 2012 version of the CompTIA A+ exams.

Who This Book Is For

The CompTIA A+ exams are designed for individuals with at least 12 months of hands-on experience in the lab or field. If you have that experience, then this book will be an excellent late-stage study tool. However, if you have not acquired that experience, I recommend that you register for a hands-on A+ course or, at the very least, purchase an authorized A+ study guide such as the A+ Exam Cram or the more in-depth A+ Cert Guide. After you take the course and/or read the study guide (or guides), return to this book as your late-stage test preparation to be used just before taking the real exams.

What You Will Find in This Book

In every chapter devoted to practice exams, you will find the following three elements:

- ▶ **Practice Questions:** There are 700 questions that will help you learn, drill, and review for the exam. All of the questions in this section are multiple-choice.

- ▶ **Quick-Check Answer Key:** After you have finished answering the questions, you can quickly grade your exam from this section. Only correct answers are given in this section. No explanations are offered yet. Even if you have answered a question incorrectly, do not be discouraged. Keep in mind that this is not the real exam. You can always review the topic and do the questions again.

▶ **Answers and Explanations:** This section provides you with correct answers as well as further explanations about the content posed in that question. Use this information to learn why an answer is correct and to reinforce the content in your mind for the exam day.

The book also comes with a supplemental disc. It contains a simulated testing environment where you can take all seven exams on the computer in study mode or in full practice test mode.

Hints for Using This Book

Complete your exams on a separate piece of paper so that you can reuse the practice questions again if necessary. Also, plan to score 90% or higher on each exam before moving on to the next one. The higher percentages you score on practice question products, the better your chances for passing the real exam.

I am available for questions at my website:

www.davidlprowse.com

I answer questions Monday through Friday, usually in the mornings.

Need Further Study?

Consider a hands-on A+ course, and be sure to see the following sister products to this book:

▶ *CompTIA A+ Exam Cram, Sixth Edition* by David L. Prowse (ISBN: 978-0789749710)

▶ *CompTIA A+ Cert Guide, Third Edition* by Mark E. Soper, et al (ISBN: 978-0789749802)

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3

220-801 Practice Exam B

Now let's kick it up a notch. This second 220-801 exam could be considered an intermediate practice test. I'll be mixing in some more difficult questions this time. Unlike the first exam, this one is freestyle, meaning the questions are randomized. You can expect questions from any of the domains, in any order.

Again, the goal here is to make sure you understand all of the concepts before moving on to the next test. If you didn't already, I suggest taking a break between exams. If you just completed the first exam, give yourself a half-hour or so before you begin this one. If you didn't score 90% or higher on Exam A, go back and study; then retake Exam A until you pass with 90% or higher.

Write down your answers and check them against the answer key that immediately follows the exam. After the answer key, you will find explanations for all of the answers. Good luck!

Practice Questions

1. Which of the following IP addresses would a technician see if a computer is connected to a multifunction network device and is attempting to obtain an IP address automatically but is not receiving an IP address from the DHCP server?

- ❍ **A.** 172.16.10.10
- ❍ **B.** 192.168.0.10
- ❍ **C.** 169.254.10.10
- ❍ **D.** 192.168.10.10

Quick Answer: **63**
Detailed Answer: **65**

2. 80mm and 120mm are common sizes for what type of PC component?

- ❍ **A.** Case fans
- ❍ **B.** CPUs
- ❍ **C.** Heat sinks
- ❍ **D.** Memory modules

Quick Answer: **63**
Detailed Answer: **65**

3. What is the total number of devices that can be daisy-chained to an IEEE 1394 port?

- ❍ **A.** 127
- ❍ **B.** 63
- ❍ **C.** 15
- ❍ **D.** 255

Quick Answer: **63**
Detailed Answer: **65**

4. What does a yellow exclamation point next to a device in the Device Manager indicate?

- ❍ **A.** A driver is not properly installed for this device.
- ❍ **B.** The device is disabled.
- ❍ **C.** The driver is not digitally signed.
- ❍ **D.** The device driver needs to be upgraded.

Quick Answer: **63**
Detailed Answer: **65**

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

- ❍ **A.** CMOS
- ❍ **B.** RTC
- ❍ **C.** POST
- ❍ **D.** Windows

Quick Answer: **63**
Detailed Answer: **65**

6. How should you apply spray cleaner to a monitor?

   ◯ **A.** Spray the cleaner directly on the monitor screen.

   ◯ **B.** Spray the cleaner on the top of the monitor and wipe down.

   ◯ **C.** Spray evenly on the monitor.

   ◯ **D.** Spray the cleaner on a clean, lint-free cloth first.

7. Which bus slot provides the highest video performance?

   ◯ **A.** PCI

   ◯ **B.** SCSI

   ◯ **C.** AGP

   ◯ **D.** PCIe

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

   ◯ **A.** An RJ11 jack

   ◯ **B.** A USB connector

   ◯ **C.** An RJ45 jack

   ◯ **D.** An SCSI connector

9. You just turned off a printer to maintenance it. What should you be careful of when removing the fuser?

   ◯ **A.** The fuser being hot

   ◯ **B.** The fuser being wet

   ◯ **C.** The fuser being fragile

   ◯ **D.** The fuser releasing toner

10. Where is the memory controller located in a Core 2 Duo system?

   ◯ **A.** On the CPU

   ◯ **B.** On memory

   ◯ **C.** Within the chipset

   ◯ **D.** Within the PCIe controller

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

   ◯ **A.** MIDI

   ◯ **B.** HDMI

   ◯ **C.** DVI

   ◯ **D.** DisplayPort

12. Although not used as often as a Phillips screwdriver, this tool is sometimes used to remove screws from the outside of a computer case or from within a laptop.

- ○ **A.** Monkey wrench
- ○ **B.** Torx wrench
- ○ **C.** Channel lock
- ○ **D.** Pliers

13. What is the main advantage of selecting a 64-bit operating system over a 32-bit operating system?

- ○ **A.** The ability to use software-based data execution prevention (DEP)
- ○ **B.** The ability to use unsigned drivers
- ○ **C.** The ability to access more than 4 GB of RAM
- ○ **D.** The ability to run multiple 16-bit programs in separate memory spaces

14. Moving your CPU's speed beyond its normal operating range is called _____.

- ○ **A.** Overclocking
- ○ **B.** Overdriving
- ○ **C.** Overpowering
- ○ **D.** Overspeeding

15. Which port is typically known as a serial port?

- ○ **A.** DVI
- ○ **B.** COM1
- ○ **C.** LPT1
- ○ **D.** SCSI

16. What is the most important piece of information needed to connect to a specific wireless network?

- ○ **A.** Channel
- ○ **B.** MAC address
- ○ **C.** SSID
- ○ **D.** Administrator password

17. Which password is used in the BIOS (CMOS) to prevent end users from accessing the BIOS contents?

- ○ **A.** Supervisor
- ○ **B.** User
- ○ **C.** Administrator
- ○ **D.** Local

18. Why would the display on a laptop get dimmer when the power supply from the AC outlet is disconnected?

- ○ **A.** The laptop cannot use full brightness when on battery power.
- ○ **B.** Power management settings on the laptop.
- ○ **C.** To operate properly, laptop displays require an alternating current power source.
- ○ **D.** Security settings on the laptop.

19. Which tool should always be used when working on the inside of the computer?

- ○ **A.** Cordless drill
- ○ **B.** Antistatic strap
- ○ **C.** Multimeter
- ○ **D.** Screwdriver

20. What are advantages of using the Dynamic Host Configuration Protocol (DHCP)? (Select the two best answers.)

- ○ **A.** IP addresses can be managed from a central location.
- ○ **B.** The network speed can automatically adjust based on the type of traffic being generated.
- ○ **C.** The hosts file on the computer can be validated for proper entries.
- ○ **D.** Media access control addresses can be changed.
- ○ **E.** Computers can automatically get new addressing when moved to a different network segment.

21. On a laptop, which of the following would most likely be a pointing device?

- ○ **A.** Serial mouse
- ○ **B.** PS/2 mouse
- ○ **C.** USB mouse
- ○ **D.** Touchpad

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

- ◯ **A.** Magnetic
- ◯ **B.** Optical
- ◯ **C.** Impact
- ◯ **D.** Solid-state

23. On which type of computer is RAM the most important?

- ◯ **A.** Gaming PC
- ◯ **B.** Virtualization workstation
- ◯ **C.** AV workstation
- ◯ **D.** HTPC

24. A client brings in a printer that is giving a paper-feed error. What is the most likely cause?

- ◯ **A.** The separation tab
- ◯ **B.** The developing rollers
- ◯ **C.** The paper tray
- ◯ **D.** The pickup rollers

25. Which of the following is the default port for HTTPS?

- ◯ **A.** Port 25
- ◯ **B.** Port 80
- ◯ **C.** Port 143
- ◯ **D.** Port 443

26. What is the maximum distance at which a Class 2 Bluetooth device can receive signals from a Bluetooth access point?

- ◯ **A.** 100 meters
- ◯ **B.** 10 meters
- ◯ **C.** 5 meters
- ◯ **D.** 1 meter

27. Which of the following form factors does a VGA connector comply with?

- ◯ **A.** 8P8C
- ◯ **B.** 15-pin D shell
- ◯ **C.** microATX
- ◯ **D.** RG-6

28. You and a co-worker are running network cables above the drop ceiling. The co-worker 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. What should you do first?

- ○ **A.** Cut the power at the breaker.
- ○ **B.** Move the co-worker farther down the hall.
- ○ **C.** Apply CPR.
- ○ **D.** Call 911.

29. A customer reports that an optical drive in a PC is no longer responding. What question should you ask first?

- ○ **A.** "What has changed since the optical drive worked properly?"
- ○ **B.** "Did you log in with your administrator account?"
- ○ **C.** "What did you modify since the optical drive worked?"
- ○ **D.** "Have you been to any inappropriate websites?"

30. Which device can store a maximum of 1.44 MB on a removable disk?

- ○ **A.** Floppy drive
- ○ **B.** CD-ROM
- ○ **C.** ROM
- ○ **D.** Compact Flash

31. What wireless networking standard operates at 5 GHz only?

- ○ **A.** 802.11a
- ○ **B.** 802.11b
- ○ **C.** 802.11g
- ○ **D.** 802.11n

32. What is the PC equivalent of FireWire?

- ○ **A.** IEEE 1284
- ○ **B.** USB
- ○ **C.** IEEE 1394
- ○ **D.** ISA

33. Which type of RAM has a peak transfer of 12,800 MB/s?

- ❍ **A.** DDR3-800
- ❍ **B.** DDR2-1600
- ❍ **C.** DDR3-1600
- ❍ **D.** DDR2-800

34. Which type of printer uses a print head, ribbon, and tractor feed?

- ❍ **A.** Laser
- ❍ **B.** Impact
- ❍ **C.** Inkjet
- ❍ **D.** Thermal

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

- ❍ **A.** CPU is beyond the recommended voltage range.
- ❍ **B.** Computer won't boot.
- ❍ **C.** BIOS reports low temperatures within the case.
- ❍ **D.** Spyware is installed into the browser.

36. Which of the following cable types is not affected by EMI but requires specialized tools to install?

- ❍ **A.** Cat 6
- ❍ **B.** STP
- ❍ **C.** Fiber optic
- ❍ **D.** Coaxial

37. A computer you are working on has a lot of dust inside it. How should you clean this?

- ❍ **A.** Disassemble the power supply and remove the dust.
- ❍ **B.** Use a vacuum to clean up the dust.
- ❍ **C.** Use a surface dust cleaning solution.
- ❍ **D.** Use compressed air to remove the dust.

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

- ❍ **A.** Prevents a user from rearranging the boot order
- ❍ **B.** Prevents a user from reading e-mail
- ❍ **C.** Prevents a virus from infecting the MBR
- ❍ **D.** Prevents an attacker from opening the case

39. Which function is performed by the external power supply of a laptop?

    ❍ **A.** Increases voltage

    ❍ **B.** Stores power

    ❍ **C.** Converts DC power to AC power

    ❍ **D.** Converts AC power to DC power

40. Which type of cable has only two twisted pairs?

    ❍ **A.** UTP

    ❍ **B.** POTS line

    ❍ **C.** Fiber

    ❍ **D.** Coaxial

41. How many pins would you see in a high-quality printhead on a dot matrix printer?

    ❍ **A.** 24

    ❍ **B.** 15

    ❍ **C.** 8

    ❍ **D.** 35

42. When it comes to computer case form factors, which of the following provides the most room for effective cooling?

    ❍ **A.** ATX

    ❍ **B.** BTX

    ❍ **C.** ITX

    ❍ **D.** microATX

43. A co-worker is traveling to Europe and is bringing her computer. She asks you what safety concerns there might be. What should you tell her?

    ❍ **A.** The computer is not usable in other countries.

    ❍ **B.** Check for a compatible power adapter for that country.

    ❍ **C.** Use a line conditioner for the correct voltage.

    ❍ **D.** Check the voltage selector on the power supply.

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

    ❍ **A.** Power consumption

    ❍ **B.** Display resolution and brightness

    ❍ **C.** The darkest and lightest outputs

    ❍ **D.** Power savings

45. Which of the following tools can protect you in the case of a surge?

- ❍ **A.** Torx wrench
- ❍ **B.** Antistatic strap
- ❍ **C.** Voltmeter
- ❍ **D.** Antistatic mat

46. What connector can have audio *and* video pass through it?

- ❍ **A.** VGA
- ❍ **B.** RGB
- ❍ **C.** DVI
- ❍ **D.** HDMI

47. 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 8-year-old son can help you with anything if you need it. What should you do?

- ❍ **A.** Tell the customer to get back home as soon as possible.
- ❍ **B.** Tell the customer that you are not responsible for the child.
- ❍ **C.** Tell the customer that an adult must be home while you work.
- ❍ **D.** Tell the customer that the child must be removed.

48. Which device limits network broadcasts, segments IP address ranges, and interconnects different physical media?

- ❍ **A.** Switch
- ❍ **B.** WAP
- ❍ **C.** Firewall
- ❍ **D.** Router

49. You just upgraded the CPU. Which of the following can make your computer shut down automatically after a few minutes? (Select the best answer.)

- ❍ **A.** Wrong CPU driver.
- ❍ **B.** Wrong voltage to the CPU.
- ❍ **C.** Incorrect CPU has been installed.
- ❍ **D.** The CPU has overheated.

50. Which of the following power connections might be used by hard drives? (Select the two best answers.)

    ◯ **A.** 8-pin

    ◯ **B.** 7-pin

    ◯ **C.** Molex

    ◯ **D.** 15-pin

    ◯ **E.** Berg

51. Which of the following is a valid IPv4 address for a network host?

    ◯ **A.** 127.0.0.1

    ◯ **B.** 169.254.0.0/16

    ◯ **C.** 172.17.58.254

    ◯ **D.** 255.10.15.7

52. If a lot of data is flowing through a network card, what should the activity light look like?

    ◯ **A.** Unlit

    ◯ **B.** Rapid, erratic flashing

    ◯ **C.** Solid green

    ◯ **D.** Solid yellow

53. You want to upgrade memory in your computer. Which of the following is user-replaceable memory in a PC?

    ◯ **A.** CMOS

    ◯ **B.** BIOS

    ◯ **C.** DRAM

    ◯ **D.** SRAM

    ◯ **E.** ROM

54. You are working on a very old printer, and it starts to smoke. What should you do?

    ◯ **A.** Turn off the printer.

    ◯ **B.** Call 911.

    ◯ **C.** Unplug the printer.

    ◯ **D.** Call maintenance.

    ◯ **E.** Tell the printer it is bad to smoke.

55. Which technology has the fastest data transfer rate?

- ❍ **A.** 802.11a
- ❍ **B.** 802.11b
- ❍ **C.** 802.11g
- ❍ **D.** 802.11n

56. You are asked to fix a problem with a customer's domain controller that is outside the scope of your knowledge. What action should you take?

- ❍ **A.** Learn on the job by trying to fix the problem.
- ❍ **B.** Tell the customer that the problem should be reported to another technician.
- ❍ **C.** Assure the customer that the problem will be fixed very soon.
- ❍ **D.** Help the customer find the appropriate channels to fix the problem.

57. Of the following, which IP address is private?

- ❍ **A.** 11.58.254.169
- ❍ **B.** 169.255.10.41
- ❍ **C.** 172.31.1.1
- ❍ **D.** 192.169.0.1

58. How should you remain in the face of adversity?

- ❍ **A.** Wavering
- ❍ **B.** Decisive
- ❍ **C.** Positive
- ❍ **D.** Certain

59. What is the local loopback IPv6 address?

- ❍ **A.** 127.0.0.1
- ❍ **B.** ::1
- ❍ **C.** 192.168.0.0
- ❍ **D.** FE80::/10

60. Which of the following statements is correct concerning IPv6 addresses?

- ❍ **A.** They cannot be used with IPv4.
- ❍ **B.** They are supported by all routers.

❍ **C.** They represent addressing using 128 bits.

❍ **D.** They require fiber-optic connections.

61. What operating CPU temperature is typical?

❍ **A.** 60° Fahrenheit

❍ **B.** 60° Celsius

❍ **C.** 72° Fahrenheit

❍ **D.** 72° Celsius

Quick Answer: **63**
Detailed Answer: **73**

62. You need to install a printer that can be used to print payroll checks on paper forms that have a carbon backing. Which printer technology should you select?

❍ **A.** Impact

❍ **B.** Laser

❍ **C.** Inkjet

❍ **D.** Thermal

Quick Answer: **63**
Detailed Answer: **73**

63. In current motherboards, which memory bus width can be accomplished by using the dual channel technology?

❍ **A.** 64-bit

❍ **B.** 128-bit

❍ **C.** 256-bit

❍ **D.** 448-bit

Quick Answer: **63**
Detailed Answer: **73**

64. Which of the following best describes a hub?

❍ **A.** Inspects traffic and accepts or declines transmission

❍ **B.** Determines the best route to transmit data

❍ **C.** Broadcasts data to all network devices

❍ **D.** Broadcasts data to specific network devices

Quick Answer: **63**
Detailed Answer: **73**

65. Which of the following tools could a person use to test an AC outlet? (Select the two best answers.)

❍ **A.** Multimeter

❍ **B.** PSU tester

❍ **C.** Receptacle tester

❍ **D.** Loopback plug

Quick Answer: **63**
Detailed Answer: **74**

66. What maximum data transfer rate is IEEE 1394b capable of?

○ **A.** 12 Mbps

○ **B.** 400 Mbps

○ **C.** 480 Mbps

○ **D.** 800 Mbps

○ **E.** 5 Gbps

67. Which of the following is *not* a configuration that can be made in the BIOS?

○ **A.** Boot sequence

○ **B.** Temperature thresholds

○ **C.** Overclocking

○ **D.** Install drivers

○ **E.** Intrusion detection

68. Which of the following traits and port numbers are associated with POP3?

○ **A.** Receives inbound e-mail on port 110

○ **B.** Receives inbound e-mail on port 25

○ **C.** Sends outbound e-mail on port 110

○ **D.** Sends outbound e-mail on port 25

69. When working on a computer, which of the following should you disconnect to prevent electrical shock? (Select the two best answers.)

○ **A.** Printer

○ **B.** Mouse

○ **C.** Telephone cord

○ **D.** Power cord

70. Which of the following controls the connection between the CPU and the PCIe x16 expansion slot?

○ **A.** Northbridge

○ **B.** Power supply

○ **C.** Memory

○ **D.** Memory controller

71. What is the recommended method for handling an empty toner cartridge?

- ◯ **A.** Throw it away.
- ◯ **B.** Incinerate it.
- ◯ **C.** Refill it.
- ◯ **D.** Recycle it.

72. Which type of cable would you use to connect a laptop directly to a PC?

- ◯ **A.** Cat 5e patch cable
- ◯ **B.** Parallel cable
- ◯ **C.** IEEE 1394b cable
- ◯ **D.** Cat 5e crossover cable

73. A customer experiences a server crash. When you arrive, the manager is upset about this problem. What should you do in this scenario?

- ◯ **A.** Stay calm and do the job as efficiently as possible.
- ◯ **B.** Take the customer out for a cup of coffee.
- ◯ **C.** Avoid the customer and get the job done quickly.
- ◯ **D.** Refer the customer to your supervisor.

74. Which of the following types of printers uses toner?

- ◯ **A.** Impact
- ◯ **B.** Laser
- ◯ **C.** Inkjet
- ◯ **D.** Thermal

75. 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 co-workers. What should you do?

- ◯ **A.** Turn the sheet over.
- ◯ **B.** Act as if you never saw the list.
- ◯ **C.** In secret, tell everyone who was on the list.
- ◯ **D.** Yell at the manager for having that list out.

76. In order to perform a network installation of Windows, which of the following must be supported by the computer's network interface card?

   ○ **A.** PXE

   ○ **B.** PCI

   ○ **C.** PCL

   ○ **D.** PnP

77. In which of the following slots would you place an 8x video card?

   ○ **A.** PCI

   ○ **B.** PCIe

   ○ **C.** AGP

   ○ **D.** AMR

78. Which of the following is the newest type of mouse connection?

   ○ **A.** Serial

   ○ **B.** USB

   ○ **C.** PS/2

   ○ **D.** Parallel

79. How can you reduce the chance of ESD? (Select the three best answers.)

   ○ **A.** Use an antistatic strap.

   ○ **B.** Use an antistatic mat.

   ○ **C.** Raise the temperature.

   ○ **D.** Raise the humidity.

   ○ **E.** Lower the humidity.

   ○ **F.** Work in a carpeted area.

80. Which of the following is a unique characteristic of a dual-core processor versus a single-core processor?

   ○ **A.** A dual-core processor has two cores, with separate caches, on the same physical chip.

   ○ **B.** A dual-core processor has several unique cores, with the same cache, on two different chips.

   ○ **C.** A dual-core processor uses higher voltage than a single-core processor.

   ○ **D.** A dual-core processor requires more RAM to function than a single-core processor.

81. Which of the following devices is the least likely to be replaced on a laptop?

- ❍ **A.** CPU
- ❍ **B.** RAM
- ❍ **C.** PC Card
- ❍ **D.** Keyboard

82. If your "bandwidth" is 1000 Mbps, how many bits are you sending/receiving? (Select the two best answers.)

- ❍ **A.** 100,000,000 bits per minute
- ❍ **B.** 1000 bits per second
- ❍ **C.** 1,000,000,000 bits per second
- ❍ **D.** 1 gigabit per second

83. Which of the following is an example of a broadband connection?

- ❍ **A.** Cable Internet
- ❍ **B.** Ethernet
- ❍ **C.** Client/Server
- ❍ **D.** IEEE 802.3

84. Which of the following can send data the farthest?

- ❍ **A.** Multi-mode fiber
- ❍ **B.** Single-mode fiber
- ❍ **C.** STP
- ❍ **D.** Coaxial

85. You need to expand the peripherals of a computer, but the system doesn't have enough ports. Which type of card should you install?

- ❍ **A.** Modem
- ❍ **B.** Network adapter
- ❍ **C.** USB card
- ❍ **D.** TV tuner card

86. Which of the following is a typical speed of a SATA hard drive?

- ❍ **A.** 1000 Mbps
- ❍ **B.** 3.1 GHz
- ❍ **C.** 8 GB
- ❍ **D.** 7200 RPM

87. Which of the following should you use to clean a monitor's screen if you are not sure how to do so?

- ○ **A.** Isopropyl alcohol
- ○ **B.** Mild detergent
- ○ **C.** Water
- ○ **D.** Boric acid

88. 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, whereas a router interconnects one or more networks.
- ○ **B.** A router broadcasts all data packets that are sent on the network, and a switch transmits data directly to the device.
- ○ **C.** A switch broadcasts all data packets that are sent on the network, and a router transmits data directly to the device.
- ○ **D.** A switch interconnects one or more networks, whereas a router interconnect devices on a network.

89. Ray wants to install a new internal SATA hard drive in his computer. Which types of cables should he connect to the drive? (Select the two best answers.)

- ○ **A.** 7-pin data cable
- ○ **B.** 40-pin data cable
- ○ **C.** 4-pin power cable
- ○ **D.** 15-pin power cable

90. 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?

- ○ **A.** DVD
- ○ **B.** Dual-Layer DVD
- ○ **C.** External USB hard drive
- ○ **D.** DLT

91. You are required to rip the contents of a CD to a compressed file format that can be read easily on PCs, Linux computers, or Macs. Which format should you select?

  ❍ **A.** .AAC

  ❍ **B.** .WMA

  ❍ **C.** .MP3

  ❍ **D.** .MOV

92. You need to replace and upgrade the memory card in a smartphone. Which type of memory does the smartphone most likely use?

  ❍ **A.** SSD

  ❍ **B.** CF

  ❍ **C.** USB flash drive

  ❍ **D.** SD

93. Your organization relies heavily on its server farm for resources and is less reliant on the client computers. Which type of client computer does the organization most likely use?

  ❍ **A.** Virtualization workstation

  ❍ **B.** Client/Server

  ❍ **C.** Thin client

  ❍ **D.** Thick client

94. What are the respective functions of the two corona wires in a laser printer? (Select the two best answers.)

  ❍ **A.** Condition the drum to be written to

  ❍ **B.** Transfer toner from the drum to the paper

  ❍ **C.** Fuse the toner to the paper

  ❍ **D.** Clean the drum

95. Which of the following capabilities enables a printer to store multiple documents?

  ❍ **A.** Buffer

  ❍ **B.** Print driver

  ❍ **C.** Printer pool

  ❍ **D.** Spooling

96. While you explain a technical concept to a customer, what is the best action for you to take?

❍ **A.** Recommend a training class.

❍ **B.** Sit next to the customer.

❍ **C.** Use acronyms so that the customer feels comfortable about your knowledge.

❍ **D.** Tell the customer to read the manual.

97. You are setting up a SOHO network with DSL. Which of the following devices should you place on the phone line so that the line can be shared with a phone and the DSL modem?

❍ **A.** Line filter

❍ **B.** Heat sink

❍ **C.** Router

❍ **D.** Coax splitter

98. One way to provide preventive maintenance to a hard drive is to do what?

❍ **A.** Upgrade the cache on the drive to improve performance.

❍ **B.** Increase the amount of RAM on the PC to increase the page file.

❍ **C.** Install a second hard drive.

❍ **D.** Keep an area of airflow around the drive so that it doesn't overheat.

99. After a blackout, the power comes back on, causing a surge to occur on all the computers and equipment in the office. Your co-worker's laptop display doesn't come on. However, if you look closely at the display, you can see that Windows is running, but very dimly. What could be the cause of this problem?

❍ **A.** The inverter has been shorted out.

❍ **B.** The power supply has failed.

❍ **C.** The display is not getting power.

❍ **D.** The display driver has failed.

100. Which tool would you use to test a 24-pin ATX 12v power connector?

❍ **A.** Torx wrench

❍ **B.** Multimeter

❍ **C.** Receptacle tester

❍ **D.** Tone and probe kit

Quick-Check Answer Key

1.	C	**30.**	A	**59.**	B
2.	A	**31.**	A	**60.**	C
3.	B	**32.**	C	**61.**	B
4.	A	**33.**	C	**62.**	A
5.	C	**34.**	B	**63.**	B
6.	D	**35.**	A	**64.**	C
7.	D	**36.**	C	**65.**	A and C
8.	C	**37.**	D	**66.**	D
9.	A	**38.**	A	**67.**	D
10.	C	**39.**	D	**68.**	A
11.	A	**40.**	B	**69.**	C and D
12.	B	**41.**	A	**70.**	A
13.	C	**42.**	B	**71.**	D
14.	A	**43.**	D	**72.**	D
15.	B	**44.**	C	**73.**	A
16.	C	**45.**	B	**74.**	B
17.	A	**46.**	D	**75.**	B
18.	B	**47.**	C	**76.**	A
19.	B	**48.**	D	**77.**	C
20.	A and E	**49.**	D	**78.**	B
21.	D	**50.**	C and D	**79.**	A, B, and D
22.	A	**51.**	C	**80.**	A
23.	B	**52.**	B	**81.**	A
24.	D	**53.**	C	**82.**	C and D
25.	D	**54.**	C	**83.**	A
26.	B	**55.**	D	**84.**	B
27.	B	**56.**	D	**85.**	C
28.	D	**57.**	C	**86.**	D
29.	A	**58.**	C	**87.**	C

88. A	**93.** C	**98.** D
89. A and D	**94.** A and B	**99.** A
90. D	**95.** A	**100.** B
91. C	**96.** B	
92. D	**97.** A	

Answers and Explanations

1. **Answer: C.** 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. All of the other addresses could possibly be obtained from a DHCP server. 172.16.10.10 is a Class B private IP. 192.168.0.10 and 192.168.10.10 are Class C private IP addresses.

2. **Answer: A.** Case fans are measured in mm (millimeters). 80mm and especially 120mm are very common. They are used to exhaust heat out of the case. This aids in keeping the CPU and other devices cool. CPUs commonly use a heat sink/fan combination. However, the two are often connected together. Memory modules don't use fans, but they can be equipped (or purchased) with heat sinks of their own.

3. **Answer: B.** An IEEE 1394 (FireWire) chain can have up to 63 devices. USB can handle up to 127 devices, though both of these numbers are outside the realm of normalcy for most individuals! 15 is the maximum amount of devices that can be on a SCSI chain. Remember this doesn't count the SCSI card. 255 is a commonly used number when it comes to maximums but doesn't apply to IEEE 1394.

4. **Answer: A**. If you see a yellow exclamation point in the Device Manager, this indicates that the device does not have a proper driver. If the device is disabled, it will have either a down arrow (for Windows 7/Vista) or a red x (Windows XP). If a driver was not digitally signed, the device might show up in the Unknown devices category until it is installed properly. If a device has a working driver, then upgrading it will be up to you, but you won't necessarily be notified of this.

5. **Answer: C.** As the POST checks all the components of the computer, it may present its findings on the screen or in the form of beep codes. The complementary metal-oxide semiconductor (CMOS) stores information such as time and date and BIOS passwords. RTC stands for real-time clock; it is the device that keeps time on the motherboard. Windows generates all kinds of error codes but not beep codes. The beep codes come from the POST, which happens before Windows boots.

6. **Answer: D.** Never spray any cleaner directly on a display. Spray on a lint-free cloth first, and then wipe the display gently. Try not to get any liquid in the cracks at the edge of the screen. A lot of companies sell products that are half isopropyl alcohol and half water. You could also make this yourself. Again, remember to put the solution on a lint-free cloth first.

7. **Answer: D.** PCI Express (PCIe) offers the highest video performance. A PCIe x16 version 3 card can transfer a maximum of 16 GB/s. Compare this to the closest competitor listed: AGP, which can do 2,133 MB/s, about 1/8 of PCIe. SCSI is used for hard drives and scanners among other things, but not for video. PCI is the predecessor to PCIe but is rarely used for video anymore; it is limited to 133 or 266 MB/s depending on the speed. Either way, it doesn't hold a candle to PCIe.

8. **Answer: C.** The RJ45 jack enables a connection to a twisted-pair (most likely Ethernet) network. Printers with a built-in RJ45 connector are network ready. RJ11 ports are used by modems and dial-up Internet connections. If a printer has this, then it is a multifunction printer acting as a fax machine. USB is the standard port for a printer.

This allows it to connect to a PC or to a print server. SCSI connectors are not often found on today's printers; regardless, they would indicate a local connection, not a network connection.

9. **Answer: 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. The fuser is not wet or fragile, and it does not contain toner—that is contained by the cartridge.

10. **Answer: C.** On Core 2 Duo, Quad, and Extreme systems, the memory controller is located within the chipset and is known as the Memory Controller Hub (MCH) by Intel, but it is also referred to as the northbridge. On AMD systems and newer Intel systems such as the Core i5 or i7, the memory controller is located "on-die," meaning within the CPU.

11. **Answer: A.** 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. The other three connectors, HDMI, DVI, and DisplayPort, are all video connectors.

12. **Answer: B.** The Torx wrench is a special tool used to remove screws from the outside of a case; often, proprietary computer manufacturers will use these screws. It can also be used to remove screws (albeit smaller ones) from a laptop. The standard is the size T-10 Torx wrench. But you might also use a T-8 and even a T-6 on laptops.

13. **Answer: C.** If you want to access more than 4 GB of RAM, you will need a 64-bit operating system. 32-bit OSes are limited to 4 GB of RAM, and in some cases 3.25 GB. Many computers today, especially custom computers such as virtualization systems and gaming computers, require more than 4 GB of RAM so a 64-bit operating system is the only choice. Data Execution Prevention (DEP) is a security feature in today's operating systems; it stops a program from executing code in a forbidden area of memory. Most of today's 32-bit or 64-bit systems offer this. Unsigned drivers are based on the operating system itself; whether that particular OS is 32-bit or 64-bit will not be a factor. You must be an administrator to allow the use of unsigned drivers. 32-bit operating systems can run older 16-bit programs, but 64-bit operating systems will have problems running 16-bit programs even in compatibility mode.

14. **Answer: A.** Overclocking is the act of increasing your CPU's operating speed beyond its normal rated speed. The rest of the terms are not used in relation to this concept.

15. **Answer: B.** COM1 (communications port 1) is a serial port; it sends or receives one bit at a time, up to 115,200 Kbps. A typical example is the 9-pin male DE9 port (inaccurately referred to also as the DB9). DVI is a video port. LPT1 is an older parallel printing port. SCSI is a parallel port used by hard drives and tape drives. The older COM port is used by dial-up modems. It is also used to program devices such as handheld terminals. You don't see COM ports on PCs today, but you might still see them as an add-on card in the field, used to access networks as an administrator fail-safe in case other Internet connectivity methods fail. In rural areas, people may still use internal or external dial-up modems. The external modem is what connects to the COM1 serial port. Though USB is also technically a "serial" port, most technicians and professionals refer to the serial port as COM1 or COM2.

16. **Answer: C.** The SSID is the most important piece of information required to connect to a wireless network; it is the name of the wireless network. The wireless channel number isn't necessarily needed; the wireless access point (WAP) might auto-negotiate the channel. Also, MAC address filtering is not enabled by default, so the MAC address might not be needed. (In fact, this would be entered by the admin at the wireless access point, not from the client computer.) The administrator password is needed only if you wanted to make configuration changes to the wireless access point. For example, if you wanted to implement MAC filtering, you would have to log in to the WAP with an admin password to configure it.

17. **Answer: A.** The supervisor (or system) password is used so that only the technician can get into the BIOS (CMOS). The user password is used to password-protect whatever operating system is running on the computer, but it does it from the firmware level. An "administrator" password is something used in Windows or on a networking device, and a local password is something used in software.

18. **Answer: B.** 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 in order to conserve battery power. These can be configured within Power Options in Windows. You can certainly set the display to full brightness when on battery power—it just isn't recommended. Laptops can operate properly when connected to the AC power adapter or when using the battery only. The display brightness of a laptop isn't affected by any security settings.

19. **Answer: B.** Always use an antistatic strap to avoid ESD (electrostatic discharge). Power tools and battery-operated tools such as cordless drills should be avoided. Although multimeters and screwdrivers are tools you *might* use, they might not always be necessary, whereas the antistatic strap should *always* be worn.

20. **Answers: A and E.** Advantages of using DHCP include: 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). Quality of Service (QoS) adjusts the network speed based on the type of traffic generated. DHCP has nothing to do with the Hosts.txt file; that file contains static entries of hostname to IP address conversions. Media Access Control addresses are usually not changed on a network adapter, although they can be masked. MAC filtering maintains a list of MAC addresses that are allowed to access a network, but once again, this is a different concept from DHCP.

21. **Answer: D.** The touchpad is the most likely of the listed devices. Serial devices (and the port in general) are found less and less often on laptops. (They are extinct on new laptops.) PS/2 mice are also rare. Both of these have given way to the touchpad and external USB mice.

22. **Answer: A.** The traditional hard drive is still the magnetic disk. This is because it is well known and has a low cost per MB of storage space. There are optical hard drives, but they are rare; optical drives are commonly implemented as CD, DVD, or Blu-ray drives. Impact refers to a type of printer, such as the dot matrix or the daisy wheel printer. Solid-state hard drives are gaining in popularity because they have no moving parts, are quiet, and work as fast as (if not faster than) traditional magnetic hard drives. However, they are far more expensive than the traditional drive, which slows their general acceptance.

23. **Answer: B.** 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 will often have more than one virtual machine running, increasing its need for RAM even further. Gaming PCs biggest requirements are CPU and video card. Audio/video workstations require specialized audio and video cards, fast hard drives, and dual monitors. Home theater PCs (HTPCs) require an HDMI output, surround sound, a small form factor, and possibly a TV tuner.

24. **Answer: D.** Paper-feed errors are often caused by the pickup rollers, which are in charge of feeding the paper into the printer. If a separation tab fails, it might cause more than one sheet of paper to be entered into the printer. The developing rollers transfer ink to the imaging drum. The paper tray simply holds the paper. It should not cause paper-feed errors unless the constraining tabs are too tight.

25. **Answer: D.** Port 443 is the default port for Hypertext Transfer Protocol Secure (HTTPS). This is the protocol used during online banking sessions, or if you go to checkout when shopping online. Port 25 is the default port for SMTP. Port 80 is HTTP. Port 143 is the Internet Message Access Protocol (IMAP); it's similar to POP3 but offers offline operation, and multiple clients can access the same mailbox.

26. **Answer: B.** Class 2 Bluetooth devices have a maximum range of approximately 10 meters. Class 2 devices are the most common (for example, Bluetooth headsets). Class 1 has a 100-meter range, and Class 3's range is approximately 1 meter. The maximum length of a standard USB 2.0 cable is 5 meters.

27. **Answer: B.** The VGA connector uses a D shell (also referred to as D-sub) 15-pin connector. It has three rows of five pins. The 8P8C is the technically correct name for an RJ45 networking plug. microATX is a motherboard form factor commonly used in smaller PCs and HTPCs. RG-6 is the connector used for cable TV and cable Internet connections.

28. **Answer: D.** Because the immediate danger is gone, call 911 right away. Then apply first aid and CPR as necessary. The next step would be to shut the power off at the electrical panel or call the building supervisor to have the power shut off.

29. **Answer: A.** You should first ask if anything has changed since the optical drive worked properly. Don't blame the user by asking what "you" modified; it implies that you think the user caused the issue. Always ask if anything has changed first before any other questions. Try not to accuse a user of accessing inappropriate websites because this could be considered inflammatory and harassment. Think like a robot with the single purpose of fixing the problem, but act like a professional and courteous human being!

30. **Answer: A.** The floppy disk drive (FDD) stores a maximum of 1.44 MB on a removable disk (1.38 MB of which is actual data). CD-ROM drives use removable discs; however, the maximum they can store is much greater. Note that magnetic disks are spelled with a *k*, while optical discs are spelled with a *c*. The acronym *ROM* usually refers to a chip on a circuit board that is not removable. Compact Flash comes in varying sizes (all greater than 1.44 MB) and is considered a card, not a disk.

31. **Answer: A.** 802.11a operates at 5 GHz only. 802.11b and g operate at 2.4 GHz. 802.11n operates at either 2.4 or 5 GHz. The IEEE 802.11 wireless standards are

collectively known as 802.11x. There is no actual 802.11x standard; it was not used in order to avoid confusion. 802.11x is instead a variable that you will sometimes see that refers to two or more 802.11 technologies.

32. **Answer: C.** IEEE 1394 is the PC equivalent of FireWire. FireWire was originally developed by Apple, and although the two names are often used interchangeably, the PC standard is IEEE 1394. USB is the Universal Serial Bus, a similar standard but with a different architecture and data transfer rate. IEEE 1284 is an older parallel PC standard for printer cables and connections. ISA is the Industry Standard Architecture, a legacy 16-bit adapter card slot.

33. **Answer: C.** DDR3-1600 has a peak transfer rate of 12,800 MB/s. It runs at an I/O bus clock speed of 800 MHz and can send 1600 megatransfers per second (MT/s). It is also known as PC3-12800. To figure out the data transfer rate of DDR3 from the name "DDR3-1600", simply multiply the 1600 by 8 (bytes) and solve for megabytes: 12,800 MB/s. To figure out the data transfer rate of DDR3 by the consumer name "PC3-12800", 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, 800 MHz), multiply the clock speed by 2 and then multiply that number by 8 and solve for megabytes: 800 MHz×2×8 = 12,800 MB/s.

   DDR3-800 has a peak transfer rate of 6,400 MB/s; it is also known as PC3-6400. There is no DDR2-1600. The fastest DDR2 standard is DDR2-1066, which has a peak transfer rate of 8,533 MB/s. DDR2-800 (like DDR3-800) has a peak transfer rate of 6,400 MB/s. It is commonly sold as PC2-6400.

34. **Answer: B.** The impact printer uses a print head, ribbon, and tractor feed. An example of an impact printer is the dot matrix. Laser printers are much more complex and use more parts. Inkjet printers use a print head but use an ink cartridge instead of a ribbon and don't use a tractor feed. Thermal printers use a print head and a special heating element.

35. **Answer: 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. It could also be caused by overclocking. Check in the BIOS to see if the CPU is overclocked or not. 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 freezing!), and spyware is unrelated to this issue.

36. **Answer: C.** Fiber-optic cable is the only answer listed that is not affected by electromagnetic interference (EMI). This is because it does not use copper wire or electricity, but instead uses glass or plastic fibers and light. Any copper cable will be susceptible to EMI to a certain degree. Regular UTP cable such as Cat 5e or Cat 6 will be very susceptible. Coaxial slightly less, and shielded twisted-pair (STP) even less than that. STP is difficult to install and must be grounded; because of these things, it is found less commonly in networks. To truly protect from EMI, fiber-optic is the best way to go.

37. **Answer: D.** Compressed air is safe. However, you might want to do this outside and vacuum up the left over residue. Never disassemble the power supply. It is called a field replaceable unit (FRU) for good reason. Do *not* stick a vacuum cleaner inside a computer; it could damage the components. Do *not* spray any kind of solutions inside the computer; this will damage the components.

38. **Answer: A.** Setting an admin password in the BIOS prevents a user from rearranging the boot order. The idea behind this is to stop a person from attempting to boot off of 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 (also known as supervisory) password. That'll stop 'em right in their tracks! The admin password does not prevent any of the other listed answers. To prevent a user from reading e-mail, you would have to remove e-mail applications (such as Outlook) and probably take away the browser, too! (Doesn't sound feasible.) To prevent a virus from infecting the MBR, you could turn on boot sector scanning in the BIOS (if the motherboard supports it). To prevent an attacker from opening the case, use a case lock. To find out if someone attempted to get into the computer itself, turn on the chassis intrusion alert in the BIOS.

39. **Answer: D.** 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 will usually not work with different laptops, even if the voltages are only slightly different. The adapter does not store power; that is the responsibility of the laptop battery. It is also accomplished by a UPS, though you probably wouldn't lug one of those around with your laptop while travelling.

40. **Answer: B.** The plain-old telephone service (POTS) line has two twisted pairs of copper wire, for a total of four wires. It is used for telephone landlines. Unshielded twisted pair (UTP) has four pairs, eight wires total. Fiber-optic cable has a single glass or plastic core that sends light. Coaxial has a single core of copper.

41. **Answer: A.** High-quality dot matrix printheads can come in 9, 18, or 24 pins, with 24 being the highest quality.

42. **Answer: B.** The BTX form factor provides the most room for effective cooling in a computer case. BTX was designed as a replacement for ATX; it was expected to help cool devices that used a lot of power and created a lot of heat. However, CPUs, RAM, and video cards have new designs that allow them to use less voltage and therefore create less heat, making BTX less necessary. Still, BTX combines a large cooling area with smart design and positioning of devices that allows for more cooling than is possible with ATX and its derivatives, or the various ITX versions.

43. **Answer: D.** Some power supplies have selectors for the United States and Europe (115 and 230 volts). However, your co-worker might need an adapter, too; otherwise, the plug may not fit. Newer power supplies might auto-sense the voltage. If the power supply doesn't have one of those red switches, check the documentation to see if it can switch the voltage automatically. Line conditioners simply clean the power for a specific voltage. If your circuit has dirty power (for example, it is fluctuating between 113 and 130 volts), a line conditioner will keep it steady at 120 volts.

44. **Answer: C.** LCD 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; this done as a test with a checkerboard pattern. But there is also the dynamic contrast ratio, a newer 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 isn't any real uniform standard for measuring contrast ratio.

45. **Answer: B.** Most antistatic straps come with a 1 mega ohm 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; and 2) don't touch any components that hold a charge. This means don't open power supplies or CRT monitors, and don't touch capacitors on any circuit boards such as motherboards. And, of course, stay away from any other electrical devices when working on computers.

46. **Answer: D.** High-Definition Multimedia Interface (HDMI), as the word *multimedia* implies, can transmit video and audio signals. VGA, RGB, and DVI are video standards only, with DVI being the newest and most commonly used on PC monitors.

47. **Answer: C.** Whenever you're working in someone's home, make sure that there is an adult available. It is not your responsibility to watch over children, nor should any company agree to have its consultants do this. If the person insists on leaving, and you can pack up your things before he goes, do so, and then call your supervisor to inform her of the event.

48. **Answer: D.** 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. A switch connects multiple computers together on the LAN; it does not limit IP-based network broadcasts. However, the switch does not segment by IP address—it communicates with computers and segments the network, via MAC addresses. Also, the switch will normally use one type of media: twisted pair, connecting to RJ45 ports. However, it is possible that the switch might connect to another switch by way of a specialized fiber-optic connector. A wireless access point (WAP) connects the computers on the wireless LAN (WLAN). It often has only one connection, a single RJ45 port. A hardware-based firewall will usually connect to the network via RJ45; regardless, it will have only one or only a few connections. It doesn't deal with routing, or broadcasts; instead it prevents intrusion to a network.

49. **Answer: D.** The CPU could overheat if thermal compound has not been applied correctly (common) or if it is not seated properly (rare). As part of the boot process, power needs to verify the CPU. If the wrong voltage is running to the CPU, the system won't even boot. If an incorrect CPU has been installed, the system will probably not boot, especially if the BIOS doesn't recognize it. Finally, the CPU doesn't use a driver; instead the BIOS recognizes it (or doesn't, if it needs a BIOS update) and passes that information to the operating system.

50. **Answers: C and D.** Molex power connectors are used by IDE drives. 15-pin power connectors are used for SATA drives. 8-pin power connectors are used by high-end PCI Express video cards. There are several types of 7-pin connectors, such as SATA data, and S-Video, but 7-pin power connections are less common. Berg is the power connector for floppy drives. Okay, we are halfway through the exam. Take a deep breath—then continue on with power! (Pun intended.)

51. **Answer: C.** 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 (hosts). 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. 127.0.0.1 is the local loopback address. Every computer using TCP/IP gets this address; it is used for testing. It cannot be used to communicate with other hosts on the network. 169.254.0.0/16 means an IP address of 169.254.0.0 with a default subnet mask of 255.255.0.0, indicating the network number is 169.254. It is not a valid *host* IP address because it ends in 0.0. The first IP address of a network is always reserved for the network number; it can not be used by a host. Otherwise, if the address was, say, 169.254.0.1, the address would work, but because it is an APIPA address, it would be able to communicate only with other systems using APIPA addresses. 255.10.15.7 is not valid. That address is within the Class E reserved range. Normal host IP addresses' first octet will either be between 1 and 126, or 128 and 223, but not between 224 and 255.

52. **Answer: B.** When data is flowing through the activity light, it should blink or flash rapidly, in an erratic fashion. You see solid green (1000 Mbps or 100 Mbps) or yellow (10 Mbps) on the link light (if there is a separate link light). If it is unlit, the cable is not connected properly or the device is malfunctioning.

53. **Answer: C.** Dynamic Random Access Memory (DRAM) is the modules (or sticks) of memory that you can install into a motherboard. SDRAM, DDR, DDR2, and DDR3 are all examples of DRAM. The complementary metal-oxide semiconductor (CMOS) is a chip that is soldered onto the motherboard that works in conjunction with the Basic Input/Output System, another chip soldered on to the motherboard. Static RAM (SRAM) is memory that is nonvolatile (as opposed to DRAM); it is also soldered to the circuit board. Read-Only Memory (ROM) is usually not serviceable. The BIOS resides on a ROM chip, more specifically an electrically erasable programmable ROM (EEP-ROM) chip.

54. **Answer: C.** Turning the printer off might not be enough. It might be seriously malfunctioning, so pull the plug. 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 supplies 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.

55. **Answer: D.** Of the listed answers, 802.11n has the fastest data transfer rate at a maximum of 600 Mbps. However, to achieve this, you need to have the right wireless access point, configured properly, with client computers that are also compatible with the 802.11n standard. 802.11a and g have a maximum DTR of 54 Mbps. 802.11b has a maximum of 11 Mbps.

56. **Answer: D.** Make sure that the customer has a path toward a solution before dismissing the issue. Do *not* try to fix the problem if the scope of work is outside your knowledge. Most PC technicians will not work on domain controllers because they are advanced Microsoft servers that are used in client/server networks.

57. Answer: C. 172.31.1.1 is the only address listed that is private. It is within the Class B range of private addresses: 172.16.1.1–172.31.255.255. 11.58.254.169 is not private because it is on the Class A 11 network. The Class A private range is within the 10.0.0.0 network. 169.255.10.41 is not private either. Microsoft's APIPA, however, uses the 169.*254*.0.0 network which is private. 192.169.0.1 is public because of the second octet: 169. The Class C private range is 192.168.0.0–192.168.255.255.

58. Answer: C. Always have a positive outlook. The customer will have fewer concerns, and you will be more relaxed. If you appear to be wavering when problems occur, the customer will have less confidence in your skills (as will you). When you need to make a technical decision, be certain and decisive and implement the solution immediately.

59. Answer: B. The IPv6 loopback address used for testing is ::1. This will determine if IPv6 is working correctly on the network card but will not generate network traffic. It exists on every computer that runs IPv6. 127.0.0.1 is the IPv4 loopback address. 192.168.0.0 is simply a private IP network number. FE80::/10 is the range of auto-assigned addresses in IPv6.

60. Answer: C. 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. IPv6 and IPv4 can co-habit a computer with no problems. IPv6 is not necessarily supported by all routers. Some routers still only support IPv4. IPv6 is a logical concept. The physical cable that connects to the computer has no bearing over which IP version is used.

61. Answer: B. 60° Celsius is a typical operating temperature for CPUs such as the Core i5 or Phenom II. The operating range may be above or below that. However, 72° Celsius becomes less typical. 60° Fahrenheit is equal to 15.5° Celsius. A processor will not run that cold (but it would be pretty efficient if it did!). 72° Fahrenheit is excellent room temperature and is what you should set the room temperature for computers to run at their best.

62. Answer: A. 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 take effect and apply text to the next layer of paper. Multipart forms such as these are commonly used for receipts. Laser printers can print to special multipart forms, but not ones with carbon backing.

63. Answer: B. Dual channel memory combines two sticks of RAM into a bank that is 128-bit. Single channel memory is 64-bit. 256-bit is a common bit length used by the Advanced Encryption Standard (AES). 448-bit memory bus width is used by some video cards. These types of video cards have much faster RAM access than mother-boards do.

64. Answer: C. A hub broadcasts data to all network devices connected to it. Because of this inefficient method, switches are preferred. Switches send information to specific network devices based on their MAC addresses. A firewall will inspect traffic and allow or deny it access to the network. Intrusion detection systems (IDSs) and intrusion prevention systems (IPSs) can also do this, but in a more intelligent manner. A router will determine the best route for data.

65. **Answers: A and C.** A receptacle tester and multimeter can be used (with caution) to test an AC outlet. A power supply (PSU) tester is used to test the main P1 power connection (and possibly other connections) of a power supply. There are various loopback plugs for testing ports on the back of a PC (for example, the RJ45 loopback plug), but these have nothing to do with testing an AC outlet.

66. **Answer: D.** IEEE 1394b is capable of 800 Mbps. Newer versions of IEEE 1394b can support 3,200 Mbps, but an IEEE 1394b port on a computer will often allow only a maximum of 800 Mbps. 12 Mbps is the data transfer rate of USB 1.1 Full Speed. 400 Mbps is the speed of IEEE 1394a. 480 Mbps is the speed of USB 2.0. 5 Gbps is the speed of USB 3.0.

67. **Answer: D.** You cannot install drivers to the BIOS. Drivers are software that allows the operating system to communicate with hardware; they can be configured in the Device Manager in Windows. The rest of the answers can be configured in the BIOS. The boot sequence (also known as boot priority or boot order) allows you to select which device will be booted off of first (hard drive is the most secure). Temperature thresh-olds allow you to set alerts and possibly shut down the system if the CPU runs too hot. Overclocking is when the CPU's voltage is raised and the speed is increased. Overclocking is not recommended, but if you do configure it, you should set tempera-ture thresholds. Intrusion detection can be enabled and will log if a person opened the computer case.

68. **Answer: A.** POP3 is the protocol used by e-mail clients to receive e-mail. It makes use of Port 110. SMTP is used by e-mail clients to send e-mail. It uses port 25.

69. **Answers: C and D.** The power cord carries 120 volts at 15 amps or 20 amps, and the telephone cord carries 80 volts when it rings. It is important to disconnect these before servicing a computer. Now, if you were opening the computer, you would disconnect everything. However, you might be fixing something that doesn't require you to open the computer—for example, connecting a network cable. Remember to always discon-nect any power, data, or telecommunications cables before working on the system.

70. **Answer: A.** The northbridge takes care of the connections between the CPU and the PCI Express (PCIe) x16 expansion slot. On older Intel systems and AMD systems, the northbridge is the first of a pair of chips in the chipset (the other is the southbridge). On newer Intel systems, the northbridge functionality is combined with the CPU.

71. **Answer: D.** Recycle toner cartridges according to your company's policies and procedures, or according to municipality rules and regulations. Do not throw away or incinerate toner cartridges. Although it is possible to refill toner cartridges, it is not the recommended way to handle an empty cartridge because it is messy and time-consuming. Most companies simply purchase new toner cartridges.

72. **Answer: D.** To connect one computer to another directly by way of network adapter cards, use a crossover cable. That cable is designed to connect *like* devices. It is wired as 568B on one end and 568A on the other. Those standards are ratified by the Telecommunications Industries Association/Electronics Industries Association (TIA/EIA). A regular (and more common) Cat 5e patch cable is known as a straight-through cable. It is used to connect *unlike* devices, such as a computer to a switch. Normally this is wired with the 568B standard on each end. A parallel cable might be used to connect an older printer to a computer or an external hard drive to a SCSI

card. IEEE 1394 cables are not used to connect computers to each other; they are used to connect external hard drives to IEEE 1394 or FireWire ports.

73. **Answer: A.** 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! I'd be interested to see what would happen if a person asked the owner of the server out for a cup of coffee, but I'm pretty sure the reaction would be negative. You don't want to avoid the customer, but you don't have to engage in anything except fixing the problem. The customer should be referred to your supervisor only if the person gets in the way of you doing your work.

74. **Answer: B.** The laser printer uses toner. Impact printers use ribbon, inkjet printers use ink cartridges, and thermal printers use specially coated paper.

75. **Answer: B.** There isn't much you can do in a situation like this. The best thing is to ignore it and act as if it never happened. Technicians must be security-minded. In addition, 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.

76. **Answer: A.** Network installations require that the network card be configured for Preboot Execution Environment (PXE). This allows the network card to boot off of the network, locate a network installation server, and request that the installation begin. This configuration might be done in the BIOS of the computer (if the network adapter is integrated to the motherboard), within a special program in Windows, or one that boots from CD (if the network adapter is an adapter card). Peripheral Component Interconnect (PCI) is an expansion bus that accepts network adapter cards, sound cards, and so on. PCL stands for Printer Command Language, developed by HP so a computer can properly communicate with dot matrix or thermal printers. PnP stands for Plug 'n Play, a Windows technology that allows devices to be located and installed automatically.

77. **Answer: C.** Any card named with a number followed by an *x* is most likely an AGP card, (2x, 4x, 8x, 16x). AGP is the Accelerated Graphics Port, usually a brown slot on the motherboard. It is faster than PCI but slower than PCIe (PCI Express) video cards. PCIe cards place the *x* before the number (for example, x16—pronounced "by 16"). AMR stands for Audio-Modem Riser, a small expansion slot developed by Intel to be used with sound cards and modems.

78. **Answer: B.** USB is the newest type of mouse connection. It replaces PS/2 as today's standard. Serial mice were used in the early 1990s, and parallel was never really used for mice at all; it was used for printers and SCSI connections.

79. **Answers: A, B, and D.** To reduce the chance of electrostatic discharge (ESD), use an antistatic wrist strap and mat. Also, consider raising the humidity. The more humidity there is, the less friction, and ultimately, less ESD. Raising the temperature will have no effect. Lowering the humidity increases the chances of ESD. Working in a carpeted area will also increase the chance of ESD; try to work in a non-carpeted area. You should also touch the chassis of the computer before handling any components. In addition, place components in antistatic bags when they are not in use.

80. **Answer: A.** A dual-core processor has two cores, with separate caches, on the same physical chip. A processor with several cores would be known as multi-core (quad-core or hex-core). Dual-core processors are generally more efficient than older single-core processors and often use less voltage. A dual-core processor does not require more RAM than a single-core, but it usually requires more cache memory. Every core of a multi-core CPU has its own L1 and L2 cache.

81. **Answer: A.** 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. However, you might upgrade, replace, or add to RAM. PC Cards (PCMCIA) are commonly implemented as network adapters, modems, and more. It is common to install and remove PC Cards. Laptop keyboards fall victim to coffee, overuse, and other damage over time and sometimes need to be replaced.

82. **Answers: C and D.** 1000 Mbps is 1000 megabits per second, otherwise notated as 1,000,000,000 bits per second, or 1 gigabit per second.

83. **Answer: A.** Cable Internet is a broadband connection. It uses multiple "channels" to transmit and receive information. All the rest of the examples are technologies that are, or use, a baseband connection (one channel on the media). Ethernet (which was originally ratified by the IEEE as the 802.3 standard) is a shared technology by default; only one computer can communicate on the network at any given time. However, Ethernet switching alleviates this by segmenting computers and redirecting information to other systems via MAC address. Client/Server is less a networking technology and more of a way that computers communicate; it has a centralized server that controls the network.

84. **Answer: B.** Single-mode fiber-optic cable can send data farther than any of the other answers—up to hundreds of kilometers. Multi-mode fiber-optic cable can send data about 600 meters. STP is a type of twisted pair; all twisted pair is limited to 100 meters or 328 feet. Coaxial cable is limited to 200 or 500 meters, depending on the type.

85. **Answer: C.** 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 would be to purchase a USB hub. Modems, network adapters, and TV tuner cards all have their own purpose and do not allow additional peripherals.

86. **Answer: D.** 7200 RPM is a typical speed of a hard drive—rotational speed, that is. Other common rotational speeds include 5400 RPM; 10,000 RPM; and 15,000 RPM. 1000 Mbps is a common network data transfer rate. SATA hard drives will commonly have a DTR of 3 Gb/s (300 MB/s) or 6 Gb/s (600 MB/s). 3.1 GHz is a common CPU frequency. 8 GB might be the amount of RAM you install in a computer or the size of a USB flash drive.

87. **Answer: C.** If you are not sure about what to clean a screen with, use water. Water will most likely not damage the screen. However, if the user manual for the monitor calls for it, you might see that you can use a half-and-half mixture of water and isopropyl alcohol. Do not use detergents on a screen; they are okay for the outside of a computer case but not the display. And boric acid would just be plain silly (and dangerous).

88. **Answer: A.** A switch interconnects devices on the same network so that they can communicate, whereas a router interconnects one or more networks. Remember that the switch is in charge of connecting devices on the LAN. But the router is in charge of connecting the LAN to another LAN, to the Internet, or to both. Multifunction network devices make matters confusing; they combine the functionality of a switch, a router, a wireless access point, and a firewall. Physically, the four-port section of the device is the switch portion and the single port that leads to the Internet is the router portion.

89. **Answers: A and D.** Internal SATA drives connect to the motherboard (or SATA card) via a 7-pin data cable and a 15-pin power cable. PATA (IDE) hard drives use a 40-pin data cable and 4-pin (Molex) power cable. Who is Ray? He's just another fictitious character in this book. You'll hear more about him later.

90. **Answer: D.** In a large corporation (or enterprise environment), tape backup such as the Digital Linear Tape (DLT) is the best media for backing up. DLTs and Super DLTs (SDLT) can have a capacity as high as 800 GB, allowing for a huge amount of backup as compared to DVD and dual-layer DVD (4.7–17 GB) and external USB hard drives (up to 64 GB or so, though this number will undoubtedly increase as time goes on).

91. **Answer: C.** The MPEG Audio Layer III (.MP3) works best when dealing with multiple platforms. Advanced Audio Codec (.AAC) is used more commonly on Apple computers and devices and gaming consoles. Windows Media Audio (.WMA) is a Microsoft format developed especially for the Windows Media Player. .MOV is a QuickTime file format meant to be used with movies and other video.

92. **Answer: D.** Smartphones typically use Secure Digital (SD) cards—more to the point, microSD cards. SSD stands for solid-state drive. This technology is implemented as flash-based hard drives or as adapter cards with DDR memory and a battery. CompactFlash (CF) cards are a bit bulkier and might be used in conjunction with PCs, laptops, and handheld computers. USB flash drives won't fit inside a typical smartphone and so are relegated to hanging on people's key chains and acting as mobile transporters of data.

93. **Answer: C.** In this scenario, the organization probably has thin-client computers for its users. These 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. Virtualization workstations definitely need a hard drive and require lots of other resources; they are not as dependent on servers. Client/server is a type of networking organizational technique. However, thin clients will often log in to a server. Thick clients are for the most part PCs, the typical desktop computer.

94. **Answers: A and B.** Know the six main steps of laser printing: Cleaning, charging, writing (also known as exposing), developing, transferring, and fusing. In the charging step, the drum is conditioned/charged by the primary corona wire (negatively charging it) and 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.

95. **Answer: A.** The printer has RAM, which acts as a buffer if you or others send multiple documents to it. It prints them one at a time according to which job entered the queue first. Don't confuse the printer's buffer with the spooler that exists on the hard drive of

the computer that controls the printer. The print driver is the software you install so that Windows can "talk" to the printer properly; it needs to be the *exact* driver. A printer pool is a group of printers (often identical) that share the duties of printing.

96. **Answer: B.** 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. Recommending a training class is tantamount to dismissing the customer off-hand. Telling the customer to read the manual is just downright rude. I know, I say this often to you the reader—however, you are a tech, so reading the manual is what you do. The customer is not supposed to be super-technically oriented. The acronym RTM should be kept within technical circles!

97. **Answer: A.** Line filters are required for DSL modems to share phone lines with a phone. A line filter shields the phone line from digital noise and interference caused by telephone devices and makes DSL communications possible. If DSL is installed in a SOHO (small office/home office), devices such as telephones, fax machines, answering machines, dial-up modems, and security alarms should have line filters. But don't install one where the DSL modem is located. A heat sink is used to disperse heat away from a CPU. A router allows access to another network or the Internet. A coaxial splitter is used to split the signal coming from a cable TV company, so that multiple TVs can be used at the same time.

98. **Answer: D.** Hard drives run pretty hot; keeping an area of airflow around the drive can help to keep it cool. The key is to make sure the PC has proper airflow. This can be done by adding fans or using a liquid cooling system. It isn't quite possible to add cache to a hard drive; the cache on most hard drives is hardwired, and there are no locations to add more. Increasing RAM does not necessarily increase the pagefile, and regardless, this won't prevent problems with a hard drive over the short term, but it can make the hard drive work more efficiently. A second hard drive should be treated as a completely separate device. However, installing the OS to one drive and storing data on the second drive can go a long way to making both drives last longer.

99. **Answer: A.** Power surges can cause the inverter to short out, after which the cold-cathode fluorescent lamps (CCFL) cannot get any power. You need to open the LCD panel to replace the inverter in this case.

100. **Answer: B.** When testing the main 24-pin ATX power connector that leads from the power supply to the motherboard, use a multimeter. It can test each individual wire's voltage. Better yet, use a power supply unit (PSU) tester. This tests them all in one shot. A Torx wrench is used to open computers and laptops that have special Torx screws; T-10 is a common size. A receptacle tester is used to test an AC outlet, although multimeters can be used for that as well. A tone and probe kit is used to test telephone and network connections for continuity. However, it can test only one pair of the wires in the cable. For better results when testing network cables, use a proper network cable testing kit. Testing tools are a key ingredient in a computer technician's toolkit.