

## Chapter 2—Working Inside a Computer

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### TRUE/FALSE

1. When disassembling a computer, it's okay to stack circuit boards on top of each other as long as you follow ESD protection rules.  
ANS: F                      PTS: 1                      REF: 46
2. Immediately after you unplug the computer from the power outlet, you're safe to begin working inside the case.  
ANS: F                      PTS: 1                      REF: 47
3. The motherboard sits on elevated screw holes or spacers to keep it from touching the case.  
ANS: T                      PTS: 1                      REF: 56
4. A system always needs the 4-pin auxiliary power connector, and sometimes needs the P1 connector as well.  
ANS: F                      PTS: 1                      REF: 61
5. A board with PCIe slots might have a 4-pin Molex power connector to provide additional power to some types of PCIe boards.  
ANS: F                      PTS: 1                      REF: 62

### MULTIPLE CHOICE

1. Which of the following is NOT a good practice when working inside a computer case?  
a. be sure to hold expansion cards by the edge connectors                      c. don't touch a microchip with a magnetized screwdriver  
b. remove loose jewelry                      d. don't touch the inside of a computer that is turned on  
ANS: A                      PTS: 1                      REF: 2
2. Which of the following is the second step in opening the case of a working computer?  
a. press and hold down the power button for a moment                      c. power down the system and unplug it  
b. back up important data                      d. open the case cover  
ANS: C                      PTS: 1                      REF: 47-48
3. To what should you normally clip the ground bracelet before you work inside the computer case?  
a. the grounding plug on the power cord                      c. the side of the computer case  
b. an AC outlet                      d. the top of the power supply  
ANS: C                      PTS: 1                      REF: 51
4. What do you call a connector on a motherboard that consists of pins that stick up from the board?  
a. jumper                      c. pin array

b. socket d. header

ANS: D PTS: 1 REF: 53

5. Which of the following can be described as round plastic or metal pegs that separate the motherboard from the bottom of the case?

a. header c. insulator  
b. standoff d. elevator

ANS: B PTS: 1 REF: 56

6. Which of the following represents the correct order in which you should install components into the case after disassembling a computer?

a. power supply, drives, motherboard, cards c. cards, motherboard, power supply, drives  
b. drives, motherboard, cards, power supply d. motherboard, drives, cards, power supply

ANS: A PTS: 1 REF: 60

7. Which of the following is true about installing the motherboard and connecting power?

a. there are typically three screw sets that hold the motherboard to the case c. the P1 connector is used for PCIe devices  
b. you can use an adapter to convert two 6-pin connectors to a PCIe connector d. a 4-pin power cord supplies supplemental power to the processor

ANS: D PTS: 1 REF: 60-61

8. Which of the following is NOT a typical connector found on the front panel header?

a. Power SW c. SATA controller  
b. HDD LED d. Power LED+

ANS: C PTS: 1 REF: 64

9. Which of the following is the Intel maximum degree limit for processors?

a. 185 F c. 90 F  
b. 155 C d. 32 C

ANS: A PTS: 1 REF: 67

10. Which material is a cooler that sits atop the CPU most likely made of?

a. brass c. steel  
b. copper d. lead

ANS: B PTS: 1 REF: 68

11. What is placed between the bottom of the cooler heat sink and the top of the processor that makes an airtight connection between the fan and processor?

a. fan shield c. high-density oil  
b. metal fins d. thermal compound

ANS: D PTS: 1 REF: 68

12. Along with the processor, what other device is the highest heat producer in the system?

a. BIOS chip c. disk controller  
b. video card d. riser card

ANS: B PTS: 1 REF: 70

13. Under what circumstance is a liquid cooling system most likely used?
- a. overclocking
  - b. dual-core processing
  - c. multiple hard disks installed
  - d. onboard graphics controller
- ANS: A                      PTS: 1                      REF: 71
14. If your computer is in a dirty, dusty environment, what tool should you use periodically to prevent overheating?
- a. all-purpose cleaner
  - b. chip extractor
  - c. compressed air
  - d. wet cloth
- ANS: C                      PTS: 1                      REF: 72
15. What determines the physical size of a power supply and the placement of screw holes?
- a. wattage rating
  - b. manufacturer
  - c. form factor
  - d. number of connectors
- ANS: C                      PTS: 1                      REF: 74
16. Which of the following is true about fans in the computer system?
- a. they are not found in the power supply case
  - b. larger fans tend to run quieter
  - c. they're usually not needed if your room is cool enough
  - d. they always run at a fixed speed
- ANS: B                      PTS: 1                      REF: 74
17. Which technology may require that you purchase a power supply that specifically supports that technology?
- a. SLI
  - b. PCI
  - c. DIMM
  - d. USB
- ANS: A                      PTS: 1                      REF: 75
18. Which of the following is a consideration when purchasing a power supply with the correct wattage?
- a. DIMMs draw the most power
  - b. motherboards with CPU tend to draw about the same as a SATA drive
  - c. fans draw as much power as a video card
  - d. the power supply should be rated 30% higher than your needs
- ANS: D                      PTS: 1                      REF: 76
19. What is the result of using a 3-pin fan connector on a 4-pin header on the motherboard?
- a. the fan will not operate at all
  - b. the fan runs at half speed
  - c. the fan speed cannot be controlled
  - d. you will not be able to connect the fan connector
- ANS: C                      PTS: 1                      REF: 68
20. What does a small triangle embedded on a connector signify?
- a. use caution when using the connector
  - b. the wire nearest the triangle is pin 1
  - c. the pin near the triangle should be matched with a circular pin
  - d. the connector is optional and need not be attached
- ANS: B                      PTS: 1                      REF: 65

## COMPLETION

1. If you touch an ungrounded component, you could damage it with \_\_\_\_\_ electricity.

ANS: static

PTS: 1 REF: 46

2. After you unplug the computer, you should press the \_\_\_\_\_ button for about three seconds.

ANS:  
power  
on/off

PTS: 1 REF: 47

3. While working inside the computer, you should clip a \_\_\_\_\_ bracelet to the computer case.

ANS: ground

PTS: 1 REF: 51

4. The front \_\_\_\_\_ connectors lead from the front of the computer case to the motherboard.

ANS: panel

PTS: 1 REF: 55

5. A \_\_\_\_\_ uses fins that draw heat away from the processor.

ANS: heat sink

PTS: 1 REF: 67

## MATCHING

- |                       |                     |
|-----------------------|---------------------|
| a. cooler             | f. thermal compound |
| b. front panel header | g. ground bracelet  |
| c. heat sink          | h. ATX              |
| d. overclocking       | i. video card       |
| e. spacer             | j. expansion slot   |

1. uses fins that draw heat away from the processor
2. this sits on top of the processor and consists of a fan and heat sink
3. a cream that is placed between the bottom of the cooler heatsink and the top of the processor
4. a connector on the motherboard that allows the insertion of a card
5. a power supply form factor
6. you clip it to the side of the computer case to dissipate any charge between you and the computer
7. draws the most power in a system
8. running a processor at a higher frequency than recommended
9. a connector on a motherboard that consists of pins that stick up from the board
10. keeps the motherboard from touching the case

1. ANS: C	PTS: 1	REF: 67
2. ANS: A	PTS: 1	REF: 67
3. ANS: F	PTS: 1	REF: 68
4. ANS: J	PTS: 1	REF: 70
5. ANS: H	PTS: 1	REF: 74
6. ANS: G	PTS: 1	REF: 51
7. ANS: I	PTS: 1	REF: 75
8. ANS: D	PTS: 1	REF: 77
9. ANS: B	PTS: 1	REF: 53
10. ANS: E	PTS: 1	REF: 56

## SHORT ANSWER

1. What are three tips you should keep in mind before beginning work inside a computer case?

ANS:

Make notes as you work so that you can backtrack later if necessary.

Remove loose jewelry that might get caught in cables and components as you work.

To stay organized and not lose small parts, keep screws and spacers orderly and in one place, such as a cup or tray.

Don't stack boards on top of each other.

When handling motherboards, cards, or drives, don't touch the chips on the device.

Hold expansion cards by the edges.

To protect a microchip, don't touch it with a magnetized screwdriver.

Never ever touch the inside of a computer that is turned on.

Never remove the cover or put your hands inside a monitor or power supply.

As you work, remember to watch out for sharp edges on computer cases that can cut you.

In a classroom environment, after you have reassembled everything, have your instructor check your work before you put the cover back on and power up.

PTS: 1

REF: 46

2. What is the first step you should perform before working inside the case of a working computer?

ANS:

Back up important data.

PTS: 1

REF: 47

3. What should you do after you unplug the computer to be sure the power supply is completely drained?

ANS:

Press and hold down the power button for a moment.

PTS: 1

REF: 47

4. What should you do to dissipate any charge between you and the computer?

ANS:

Clip your ground bracelet to the side of the computer case.

PTS: 1

REF: 51

5. What should you do before disconnecting the wires leading from the front of the computer case to the motherboard if you don't have the motherboard manual handy?

ANS:

Be very careful to diagram how these wires connect because they are never labeled well on a motherboard.

PTS: 1

REF: 55

6. Why are motherboards installed in the case using spacers?

ANS:

A motherboard is installed so that the bottom of the board does not touch the case. If the fine traces or lines on the bottom of the board were to touch the case, a short would result when the system is running. To keep the board from touching the case, spacers or standoffs may be used.

PTS: 1

REF: 55-56

7. List and describe three front panel connectors you will likely see going from the front panel to the motherboard.

ANS:

Power SW. Controls power to the motherboard; must be connected for the PC to power up

HDD LED. Controls the drive activity light on the front panel that lights up when any SATA or IDE device is in use (HDD stands for hard disk drive; LED stands for light-emitting diode)

Power LED+. Positive LED controls the power light and indicates that power is on

Power LED-. Negative LED controls the power light; the two positive and negative leads indicate that power is on

Reset SW. Switch used to reboot the computer

PTS: 1

REF: 64

8. Describe the processor cooler and its components.

ANS:

The cooler sits on top of the processor and consists of a fan and a heat sink. A heat sink uses fins that draw heat away from the processor. The fan can then blow the heat away.

PTS: 1

REF: 67

9. How does liquid cooling work?

ANS:

Using liquid cooling, a small pump sits inside the computer case, and tubes move liquid around components and then away from them to a place where fans can cool the liquid, similar to how a car radiator works.

PTS: 1

REF: 71

10. What are two major points you should keep in mind when selecting the correct wattage capacity for a power supply?

ANS:

Video cards draw the most power. Video cards draw the most power in a system, and they draw from the +12 V output. If your system has a video card, pay particular attention to the +12 V rating. The trend nowadays is for the motherboard to provide the video components and video port, thus reducing the overall wattage needs for a system.

The power supply should be rated about 30 percent higher than expected needs. Power supplies that run at less than peak performance last longer and don't overheat. In addition, a power supply loses some of its capacity over time. Also, don't worry about a higher rated power supply using too much electricity. Components only draw what they need.

PTS: 1

REF: 75