Computers are your future

Chapter 2

inside the system unit

# Answers to End-of-Chapter Questions

Matching

\_**\_f\_**\_\_1. Bit “Representing Data as Bits and Bytes”

\_\_**i**\_\_\_2. Instruction cycle “The CPU: The Microprocessor”

\_\_**k**\_\_\_3. Port “Connectors and Ports”

\_\_**a\_**\_\_4. ASCII “Representing Characters: Character Code”

\_\_**m**\_\_\_5. Byte “Representing Data as Bits and Bytes”

\_\_**j**\_\_\_6. Connector “Connectors and Ports”

\_\_**n**\_\_7. Unicode “Representing Characters: Character Code”

\_\_**c**\_\_\_8. Arithmetic logic unit “The CPU: The Microprocessor”

\_\_**l\_**\_\_9. Cache “Memory”

\_\_**o**\_\_\_10. Control unit “The CPU: The Microprocessor”

\_\_**g**\_\_\_11. Register “The CPU: The Microprocessor”

\_\_**h\_**\_\_12. Extended ASCII “Representing Characters: Character Code”

\_\_**d**\_\_\_13. ROM “Memory”

\_\_\_**e**\_\_14. Execution cycle “The CPU: The Microprocessor”

\_\_\_**b**\_\_15. Hot swapping “Connectors and Ports”

Multiple Choice

1. What is the term used to refer to the amount of memory that a program uses while running?

a. form factor

**b. memory footprint** “Memory”

c. capacity

d. speculative execution

2. RAM is an example of which of the following?

a. nonvolatile memory

b. cache memory

**c. volatile memory** “Memory”

d. virtual memory

3. Which of the following is listed in order from smallest to largest?

a. KB, GB, MB, TB

b. KB, MB, TB, GB

c. MB, KB, GB, TB

**d. KB, MB, GB, TB** “Representing Data as Bits and Bytes”

4. Which of the following is an example of a binary number?

a. 5GA1

**b. 0101** “Representing Data as Bits and Bytes”

c. 003

d. ABC

5. Which of the following is a new port that provides greater speed, simpler upgradable storage devices, easier configuration, and an increased data tranfer rate between the motherboard and hard drive?

a. USB drive

b. PS/2

c. Ethernet

**d. SATA** “The CPU: The Microprocessor”

6. Which of the following character codes uses 16 bits and can represent many languages?

**a. Unicode** “Representing Characters: Character Code”

b. ASCII

c. PCI

d. EBCDIC

7. Which number would never describe a computer’s word size?

a. 32

b. 64

**c. 60** “The CPU: The Microprocessor”

d. 16

8. What is plug-and-play (PnP)?

a. the connecting and disconnecting of a peripheral while the system is running

**b. a feature that automatically detects new compatible peripherals connected to a system** “Connectors and Ports”

c. hard drive storage that is used as RAM when RAM is filled

d. the name of a new CPU for systems used by gamers

9. Which of the following would not be added by an expansion card?

a. additional RAM

b. sound card

c. video card

**d. additional cache** “Connectors and Ports”

10. What is the freeway of parallel connections that allows components within and connected to the system unit to communicate?

**a. bus** “Connectors and Ports”

b. port

c. ALU

d. register

**Fill-In**

1. The name, coined by Apple, for a high-speed 1394 port that best transfers digital video and digital audio data is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**FireWire** “Connectors and Ports”

2. The port to which a flash or jump drive connects is a(n)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

**USB** “Introducing the System Unit”

3. Besides SCSI and PS/2 ports, two examples of legacy hardware are \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.

**parallel ports, serial ports** “Connectors and Ports”

4. A process used by the CPU to predict what will happen and thus prevent a pipeline stall is \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.

**branch** **prediction** “The CPU: The Microprocessor”

5. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ step of the machine cycle retrieves the next program instruction from memory.

**fetch** “The CPU: The Microprocessor”

6. The two subcomponents of the CPU are \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_.

**control unit, arithmetic logic unit** “The CPU: The Microprocessor”

7. The word size of a CPU is important because it determines the \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ the CPU can run.

**operating system, software** “The CPU: The Microprocessor”

8. Video circuitry built into the motherboard is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**on-board video** “The CPU: The Microprocessor”

9. The network connector called RJ-45 that looks like a standard phone jack but is bigger and capable of faster data transfer is also called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ port.

**Ethernet**  “Connectors and Ports”

10. The \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ of a computer converts AC to DC.

**power supply** “Inside the System Unit”

11. A PC card that is the size of a credit card, fits into a designated slot, and provides capabilities such as additional memory or wireless communication is a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**ExpressCard** “Connectors and Ports”

12. \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ is a processor specifically for handheld devices and mobile Internet devices.

**Intel Atom**  “The CPU: The Microprocessor”

13. If your computer system freezes, pressing Ctrl, Alt, and Delete will access the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.

**Windows Task Manager** “The Front Panel”

14. \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ improves CPU performance by running more than one processor at the same time.

**Parallel processing** “Connectors and Ports”

15. The two types of operations performed by the ALU are \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**mathematical, logical** “The CPU: The Microprocessor”

Short Answer

1. List the four operations of the processing cycle and provide a brief description of their function.

* ***Fetch*. Retrieves the next program instruction from the computer’s memory.**
* ***Decode*. Determines what the program is telling the computer to do.**
* ***Execute*. Performs the requested instruction, such as adding two numbers or deciding which one is larger.**
* ***Store*. Stores the results to an internal register (a temporary storage location on the CPU) or to RAM.**

1. What is the difference between pipelining and parallel processing?

Pipelining is **a processing technique that feeds a new instruction into the CPU at every step of the processing cycle so that four or more instructions are worked on simultaneously. P**arallel processing is **a technique that uses more than one processor running simultaneously, in parallel.**

**Parallel processing involves multiple CPUs that work on instructions simultaneously. Pipelining involves one CPU that works on a new instruction at each of the four processing cycle steps (four instructions at four different stages).**

1. List three to five factors that affect the performance and speed of a computer.

* **CPU—The CPU is the primary component that determines performance and speed of a computer.**
* **Transistors—The number of transistors on the CPU has an effect on the performance of a computer. The more transistors and the closer their proximity to each other, the faster the processing speed.**
* **Word size—The word size, the maximum number of bits the CPU can process at one time, helps determine the speed. The word size also determines which operating system the CPU can use and which software it can run.**
* **Clock speed—The number of operations per clock tick (one pulse of the system clock) affects CPU performance.**
* **Parallel processing—Parallel processing involves multiple CPUs that simultaneously process data.**
* **RAM—The amount and type of RAM of a computer help determine the computer’s speed and performance.**
* **Cache memory—The small, ultrafast memory built into the processor helps determine the speed of a computer.**

1. What is the difference between registers and primary cache?

Registers **are temporary storage locations on the CPU that are designed to temporarily store data processed from the control unit. Some registers store the memory location from which a data element was retrieved; others store the results of intermediate calculations.** Cache memory **is a small unit of ultrafast memory built into the processor that stores frequently or recently accessed program instructions and data. The primary difference is that registers store results of instructions from the CPU, whereas cache memory stores program instructions.**

1. What is the difference between a USB port and a FireWire port? What devices connect to each? Which is more cost**-**effective?

**FireWire and USB ports are similar, but FireWire is more expensive than USB and is only used for particular high-speed peripherals such as digital video cameras, and USB ports are used for printers, keyboards, and flash or jump drives. FireWire has a data transfer rate of 400, 800, and, soon, 3.2 Gpbs, whereas USB ports have a data transfer rate of 480 Mbps.**