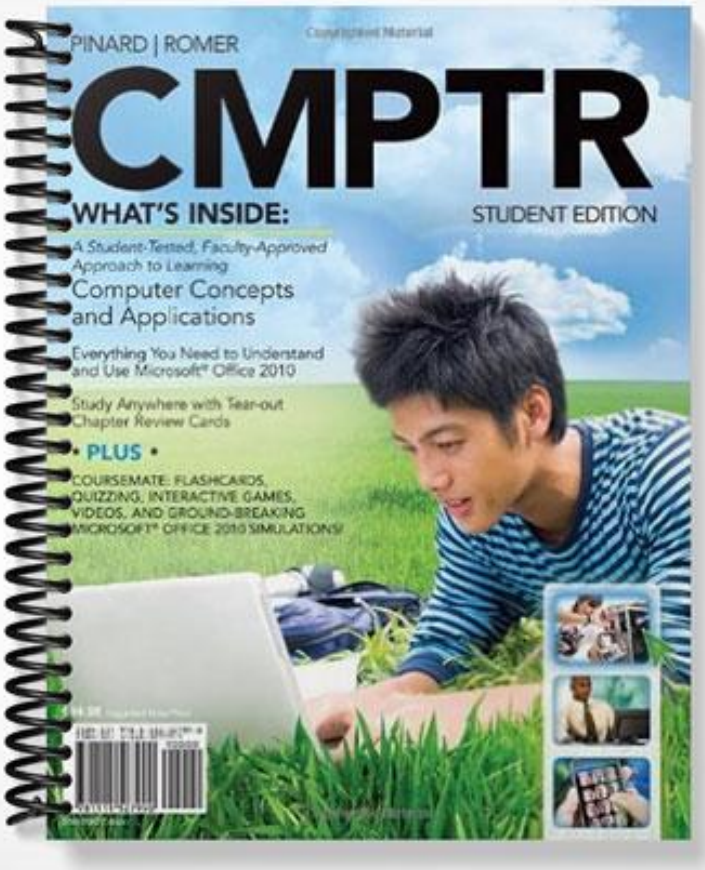
TEST BANK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Chapter 2: Computer Hardware

TRUE/FALSE

1. The main circuit board inside the system unit is called the motherboard.

   ANS: T PTS: 1 REF: 32

2. A computer byte is the amount of data (measured in bits) that a CPU can manipulate at one time.

   ANS: F PTS: 1 REF: 35

3. RAM consists of nonvolatile chips that permanently store data or programs.

   ANS: F PTS: 1 REF: 37

4. The ALU is the section of a CPU core that performs arithmetic involving integers and logical operations.

   ANS: T PTS: 1 REF: 41

5. SSD is another name for a flash memory hard drive.

   ANS: T PTS: 1 REF: 46

6. CD, DVD, and BD drives are types of optical drives.

   ANS: T PTS: 1 REF: 49

7. The quality of scanned images is measured as PPM.

   ANS: F PTS: 1 REF: 59

8. RFID refers to the ability of a computer to recognize text characters.

   ANS: F PTS: 1 REF: 61-62

9. Most computers today use CRT monitors.

   ANS: F PTS: 1 REF: 66

10. Laser printers form images with toner powder.

    ANS: T PTS: 1 REF: 72

MODIFIED TRUE/FALSE

1. The CPU is also known as the processor. _____

   ANS: T PTS: 1 REF: 33

2. ROM is used to store the essential parts of the operating system while the computer is running. _____

   ANS: F
   RAM
   Random access memory
   RAM (Random access memory)
   Random access memory (RAM)

   PTS: 1 REF: 36

3. The convenience and universal support of FireWire has made it one of the most widely used standards for connecting peripherals today. _____

   ANS: F
   USB
   universal serial bus
   USB (universal serial bus)
   universal serial bus (USB)

   PTS: 1 REF: 39

4. Each machine cycle consists of the fetch, decode, execute, and store operations. _____

   ANS: T PTS: 1 REF: 43

5. Most hard drives are magnetic. _____

   ANS: T PTS: 1 REF: 44

6. The capacity of most USB flash drives today ranges from 1 GB to 256 GB. _____

   ANS: F, 64 GB

   PTS: 1 REF: 52

7. SAN is a method of storing data on two or more hard drives that work together. _____

   ANS: F, RAID

   PTS: 1 REF: 55

8. Biometrics is the science of identifying individuals based on measurable biological characteristics. _____

   ANS: T PTS: 1 REF: 63

9. LED technology uses charged liquid crystals located between two sheets of clear material to form an image on a screen. _____

   ANS: F

LCD
Liquid crystal display
LCD (Liquid crystal display)
Liquid crystal display (LCD)

PTS: 1 REF: 67

10. Portable printers are usually the printer of choice for home use. _____

ANS: F, Inkjet

PTS: 1 REF: 72-73

MULTIPLE CHOICE

1. ____ are very small pieces of semiconducting material that contain integrated circuits.
   a. Motherboards
   b. Computer chips
   c. Optical drives
   d. Expansion slots

   ANS: B PTS: 1 REF: 32

2. The ____ is the main processing device for a computer.
   a. CPU
   b. cache
   c. USB
   d. FPU

   ANS: A PTS: 1 REF: 33

3. ____ memory is very fast memory circuitry located near the CPU that is used to speed up processing.
   a. ROM
   b. Flash
   c. Cache
   d. ALU

   ANS: C PTS: 1 REF: 35

4. The term *memory* in computers usually refers to ____.
   a. ROM
   b. BIOS
   c. RAM
   d. RAID

   ANS: C PTS: 1 REF: 36

5. ____ are the fastest type of memory used by the CPU.
   a. ROMs
   b. RAMs
   c. Caches
   d. Registers

   ANS: D PTS: 1 REF: 37

6. ____ consists of nonvolatile chips.
   a. Flash memory
   b. ROM
   c. RAM
   d. both a and b

   ANS: D PTS: 1 REF: 37

7. Today, most notebook and netbook computers use ____ to give them additional capabilities.
   a. ExpressCard modules
   b. PC Cards
   c. expansion slots
   d. USB cards

ANS: A PTS: 1 REF: 38

8. A ____ is an electronic path over which data can travel.
   a. router
   b. bus
   c. redundant array of disks
   d. sluice

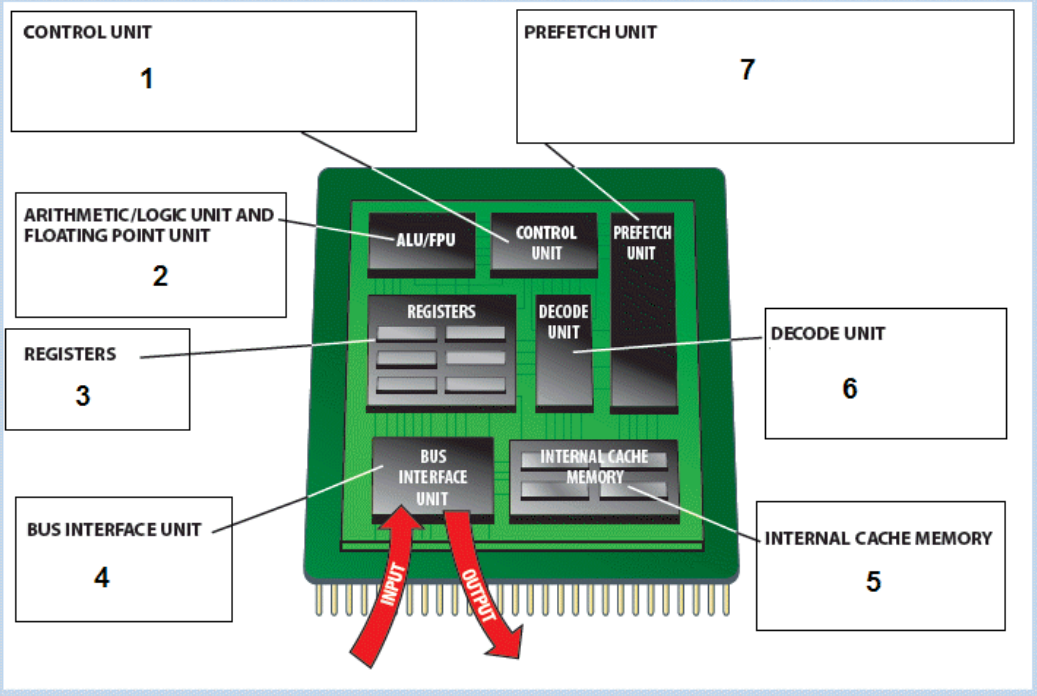
   ANS: B PTS: 1 REF: 38

9. IEEE 1394 is another name for ____.
   a. USB
   b. PCI
   c. RJ-45
   d. FireWire

   ANS: D PTS: 1 REF: 39

10. The ____ standard means that a computer automatically configures new devices as soon as they are installed and the computer is powered up.
    a. Plug and Play
    b. Fast I/O
    c. Click and Go
    d. Slot and Start

    ANS: A PTS: 1 REF: 40



11. In the accompanying figure, the item in box ____ performs the arithmetic and logical operations, as directed by the control unit.
    a. 2
    b. 3
    c. 5
    d. 7

    ANS: A PTS: 1 REF: 41

12. In the accompanying figure, the item in box ____ stores data and instructions before and during processing.
    a. 1
    b. 3
    c. 5
    d. 6

    ANS: C PTS: 1 REF: 41

13. In the accompanying figure, the item in box ____ holds the results of processing.
    a. 1
    b. 3
    c. 4
    d. 5

    ANS: B PTS: 1 REF: 41

14. In the accompanying figure, the item in box ____ takes instructions and translates them into a form that the control unit can understand.
    a. 2
    b. 3
    c. 4
    d. 6

    ANS: D PTS: 1 REF: 41

15. The ____ is a small quartz crystal located on the motherboard.
    a. ALU
    b. system clock
    c. bus interface
    d. heat sink

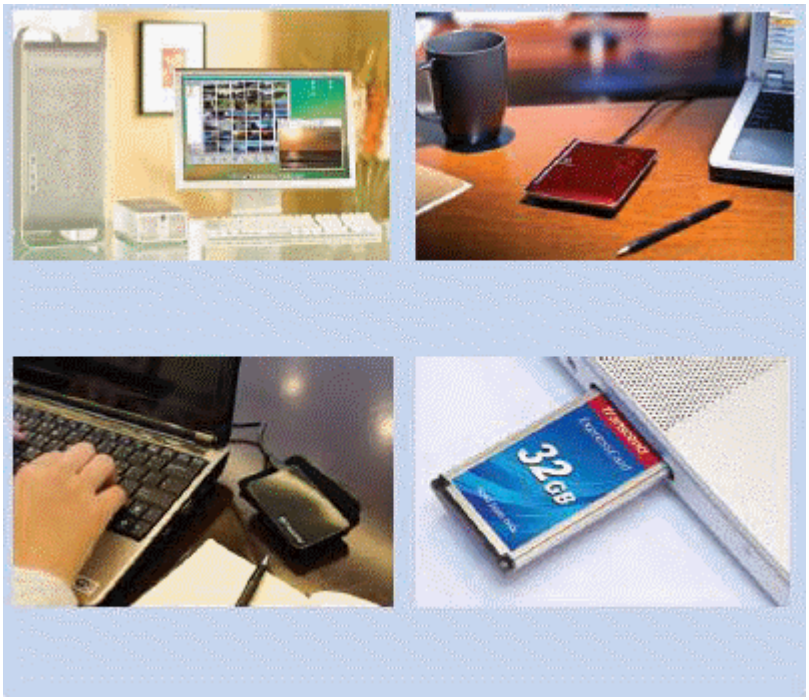
    ANS: B PTS: 1 REF: 42

16. Magnetic hard drives contain round pieces of metal called ____.
    a. platters
    b. cylinders
    c. SSDs
    d. saucers

    ANS: A PTS: 1 REF: 44

17. On most computer systems, the smallest storage area on a hard disk is a(n) ____.
    a. track
    b. cluster
    c. SSD
    d. cylinder

    ANS: B PTS: 1 REF: 44



18. The accompanying figure shows various examples of ____.
    a. SSDs
    c. external hard drives

b. flash drives
d. USB connections

ANS: C PTS: 1 REF: 46

19. ____ are thin circular discs made out of polycarbonate, topped with layers of materials and coatings used to store data and protect the disc.
a. Platters
c. SSDs
b. Optical discs
d. Hybrid hard drives

ANS: B PTS: 1 REF: 47

20. DVD+R dual-layer discs can store up to ____ of data.
a. 700 MB
c. 50 GB
b. 8.5 GB
d. 1 TB

ANS: B PTS: 1 REF: 49

21. ____ are the most common type of storage media for digital cameras and mobile phones.
a. Mini-CDs
c. Cache packets
b. Optical discs
d. Flash memory cards

ANS: D PTS: 1 REF: 51

22. ____ consists of high-performance storage servers that are connected individually to a network to provide storage for the computers connected to that network.
a. NAS
c. RAID
b. SAN
d. Cloud storage

ANS: A PTS: 1 REF: 52

23. Microsoft SkyDrive is an example of ____ storage.
a. NAS
c. cloud
b. SAN
d. direct

ANS: C PTS: 1 REF: 53

24. A smart card is the size of a ____.
a. postage stamp
c. sheet of A4 paper
b. credit card
d. postcard

ANS: B PTS: 1 REF: 53

25. ____ is a method of storing data on two or more hard drives that work together.
a. RAID
c. NAS
b. SAN
d. Cloud computing

ANS: A PTS: 1 REF: 55

26. An advantage of magnetic tape for storage is ____.
a. nonsequential access
c. durability
b. speed
d. price

ANS: D PTS: 1 REF: 55

27. A(n) ____ is any piece of equipment that is used to enter data into a computer.
a. keyboard
c. processing device
b. input device
d. I/O operator

ANS: B PTS: 1 REF: 55

28. A digital pen is also called a(n) ____.
    a. stylus
    b. trackball
    c. touch pad
    d. OCR

    ANS: A PTS: 1 REF: 57

29. A ____ is a rectangular pad most often found on notebook and netbook computers.
    a. touch pad
    b. trackball
    c. digital pen
    d. mouse pad

    ANS: A PTS: 1 REF: 59

30. DPI stands for ____.
    a. digits per input
    b. dots per inch
    c. document paging instruction
    d. Data Pre-Internet

    ANS: B PTS: 1 REF: 59

31. ____ contain tiny chips and radio antennas; the data in them is read by a reader whenever it is in range (from two inches to up to 300 feet or more).
    a. Barcodes
    b. Optical scanners
    c. OMRs
    d. RFIDs

    ANS: D PTS: 1 REF: 61

32. ____ input data from special forms to score or tally exams, questionnaires, ballots, and so forth.
    a. MICR readers
    b. RFID readers
    c. SSDs
    d. OMRs

    ANS: D PTS: 1 REF: 62

33. ____ readers are typically used to process bank checks.
    a. OCR
    b. DRR
    c. MICR
    d. SPQR

    ANS: C PTS: 1 REF: 63

34. ____ is the science of identifying individuals based on measurable biological characteristics.
    a. Eugenics
    b. Biostatics
    c. Heuristical logistics
    d. Biometrics

    ANS: D PTS: 1 REF: 63

35. A(n) ____ is the most common form of output device.
    a. Web page
    b. display device
    c. printer
    d. audio or video stream

    ANS: B PTS: 1 REF: 65

36. Of the following, ____ is the most commonly used technology in computer monitors today.
    a. OLED
    b. CRT
    c. CVJ
    d. LCD

    ANS: D PTS: 1 REF: 67

37. Of the following, ____ is the most energy-efficient technology.
    a. CRT
    b. OLED
    c. OLCD
    d. LCD

    ANS: B PTS: 1 REF: 67

38. A ____ is the smallest colorable area on a display device.
    a. byte
    b. diode
    c. pixel
    d. crystal

    ANS: C PTS: 1 REF: 68

39. All of the following are common types of interfaces used to connect a monitor to a computer EXCEPT ____.
    a. VGA
    b. DVI
    c. HDMI
    d. GPU

    ANS: D PTS: 1 REF: 69

40. Print speed is usually measured in ____.
    a. dpi
    b. dot-matrix ratios
    c. ppm
    d. dps

    ANS: C PTS: 1 REF: 71

Case-Based Critical Thinking Questions

Case 2-1
Troy is trying to build an ideal computer system for his house. He is currently looking at all the hardware options available to him.

41. Troy is comparing the DDR3 rates of different brands of an item. That item would be ____.
    a. ROM
    b. RAM
    c. USB cards
    d. CPUs

    ANS: B PTS: 1 REF: 36-37 TOP: Critical Thinking

42. Troy is not planning to upgrade his computer for at least a few years. He's looking at bus data transfer rates, and knows that the emerging ____ technology seems to offer the fastest speeds of anything on the horizon.
    a. USB 2.0
    b. FireWire 1.394
    c. SuperSpeed USB
    d. Quad-Four FireWire

    ANS: C PTS: 1 REF: 39 TOP: Critical Thinking

43. Troy sees a CPU with a clock speed rated at 3 GHz. He knows this is ____.
    a. among the fastest on the market
    b. not the fastest on the market
    c. neither a nor b
    d. not enough information to say

    ANS: A PTS: 1 REF: 35 TOP: Critical Thinking

44. In order to choose the fastest hard disk, Troy examines all of the following details EXCEPT ____.
    a. seek time
    b. latency
    c. rotational delay
    d. data movement time

ANS: B PTS: 1 REF: 47 TOP: Critical Thinking

45. Troy wants to be able to move very large amounts of data around from one physical site to another. The technology that currently will let him put the most information on one easily portable device is ____.
a. DVD+R DL
b. flash memory cards
c. USB flash drives
d. storage servers

ANS: C PTS: 1 REF: 49-54 TOP: Critical Thinking

46. Lastly, Troy is researching various display devices. He discovers that OLED technology has many plusses over LCD technology, including all of the above EXCEPT ____.
a. energy efficiency
b. wider viewing angle
c. thinner than LCDs
d. none of the above

ANS: D PTS: 1 REF: 67-68 TOP: Critical Thinking

Case-Based Critical Thinking Questions

Case 2-2
Abed works at a computer supply company. This week he has fielded a surprising number of questions about printers.

47. Abed takes a call from a factory that needs an economical printer to produce large numbers of packing slips and invoices. The emphasis is quantity over quality. Abed suggests that a(n) ____ printer might be just right.
a. dot-matrix
b. inkjet
c. nonimpact
d. laser

ANS: A PTS: 1 REF: 71 TOP: Critical Thinking

48. Next, Abed hears from someone who wants a printer that will deliver the highest resolution. Price is less of a concern. Abed recommends a(n) ____ printer.
a. ZINK
b. laser
c. inkjet
d. portable

ANS: B PTS: 1 REF: 72 TOP: Critical Thinking

49. Abed's next phone call comes from a college student who needs to print out term papers and decent quality color reports on a budget. Abed easily suggests a(n) ____ printer for her.
a. inkjet
b. laser
c. impact
d. ZINK

ANS: A PTS: 1 REF: 72-73 TOP: Critical Thinking

50. Lastly, Abed has a long discussion with a potential client about the process known as FDM. The client is most likely a(n) ____.
a. undergraduate student
b. author setting up a small home office
c. architect
d. traveling salesman who needs a portable printer

ANS: C PTS: 1 REF: 74 TOP: Critical Thinking

COMPLETION

1. A(n) _____ is the smallest unit of data that a binary computer can recognize.

   ANS: bit

   PTS: 1 REF: 31

2. A CPU that contains the processing components of multiple independent processors in a single CPU is called a(n) _____ CPU.

   ANS: multi-core

   PTS: 1 REF: 34

3. _____ cache is the fastest level of cache.

   ANS:
   L1
   Level 1

   PTS: 1 REF: 36

4. A bus's _____ is the amount of data that can be transferred via the bus in a given time period.

   ANS:
   throughput
   bandwidth

   PTS: 1 REF: 38

5. The key element of the CPU is the _____, a device that controls the flow of electrons inside a chip.

   ANS: transistor

   PTS: 1 REF: 41

6. All storage systems involve two physical parts—a storage _____ and a storage _____.

   ANS:
   medium, device
   device, medium

   PTS: 1 REF: 43

7. If the read/write heads of a magnetic hard drive touch the surface of the hard disk, a(n) _____ occurs.

   ANS: head crash

   PTS: 1 REF: 44

8. A(n) _____ stores copies of data or programs that are located on a hard drive and that might be needed soon; this can speed up performance and save hard drive wear and tear.

   ANS: disk cache

   PTS: 1 REF: 47

9. With optical discs, the term *DL* means _____.

   ANS:
   dual layer
   dual-layer

   PTS: 1 REF: 49

10. A jump _____ consists of flash memory media integrated into a self-contained unit that connects to a computer or other device via a standard USB port and is powered by the USB port.

    ANS: drive

    PTS: 1 REF: 51

11. For large computer systems, instead of finding a single hard drive installed within the system unit, you are most likely to find a(n) _____.

    ANS: storage server

    PTS: 1 REF: 54

12. The _____ is the most common pointing device for a desktop computer.

    ANS: mouse

    PTS: 1 REF: 57

13. OCR stands for _____.

    ANS: optical character recognition

    PTS: 1 REF: 62

14. _____ displays use a layer of gas between two plates of glass.

    ANS: Plasma

    PTS: 1 REF: 68

15. Most printers today are _____ printers, meaning they form images without the print mechanism actually touching the paper.

    ANS: nonimpact

    PTS: 1 REF: 71

MATCHING

a. portable app
b. CPU
c. fault tolerance
d. ROM
e. scanner
f. bus
g. SSD
h. land
i. drum
j. motherboard
k. VRAM
l. control unit

1. part of a laser printer
2. nonvolatile chips that permanently store data or programs
3. captures an image of an object in digital form
4. directs the flow of traffic within the core
5. another term for flash memory drive
6. a computer program designed to be used with a device like a thumb drive
7. memory chips inside a video card
8. the main circuit board inside the system unit
9. the main processing device for a computer
10. increased using RAID
11. an area on an optical disc that remains unchanged after data is written
12. an electronic path over which data can travel

1. ANS: I PTS: 1 REF: 72
2. ANS: D PTS: 1 REF: 37
3. ANS: E PTS: 1 REF: 59
4. ANS: L PTS: 1 REF: 42
5. ANS: G PTS: 1 REF: 46
6. ANS: A PTS: 1 REF: 51
7. ANS: K PTS: 1 REF: 69
8. ANS: J PTS: 1 REF: 32
9. ANS: B PTS: 1 REF: 33
10. ANS: C PTS: 1 REF: 55
11. ANS: H PTS: 1 REF: 48
12. ANS: F PTS: 1 REF: 38

ESSAY

1. Name and describe the two types of bus standards explored in the chapter. Include the speeds of the various standards (original, current, and emerging).

   ANS:
   One of the more versatile bus architectures is the **Universal Serial Bus** (**USB**). The USB standard allows 127 different devices to connect to a computer via a single USB port on the computer's system unit. At 12 Mbps (millions of bits per second), the original USB 1.0 standard is slow. However, the newer USB 2.0 standard supports data transfer rates of 480 Mbps, and the emerging 4.8 Gbps USB 3.0 standard (also called SuperSpeed USB) is about 10 times faster than USB 2.0. The convenience and universal support of USB have made it one of the most widely used standards for connecting peripherals today.

FireWire (also known as **IEEE 1394**) is a high-speed bus standard developed by Apple for connecting devices—particularly multimedia devices like digital video cameras—to a computer. Like USB, FireWire can connect multiple external devices via a single port. FireWire is relatively fast—the original FireWire standard supports data transfer rates of up to 320 Mbps, the newer FireWire standard (called FireWire 800) supports data transfer rates up to 800 Mbps, and the emerging FireWire 3200 standard offers 3.2 Gbps transfer rates.

PTS: 1 REF: 39 TOP: Critical Thinking

2. Name and briefly describe the six main units within a CPU that were explored in the chapter.

ANS:
The **arithmetic/logic unit** (**ALU**) is the section of a CPU core that performs arithmetic (addition, subtraction, multiplication, and division) involving integers and logical operations (such as comparing two pieces of data to see if they are equal or determining if a specific condition is true or false).

Arithmetic requiring decimals is usually performed by the **floating point unit** (**FPU**). Arithmetic operations are performed when mathematical calculations are requested by the user, as well as when many other common computing tasks are performed. For example, editing a digital photograph in an image editing program, running the spell checker in a word processing program, and burning a music CD are all performed by the ALU, with help from the FPU when needed, using only arithmetic and logical operations. Most CPUs today have multiple ALUs and FPUs that work together to perform the necessary operations.

The **control unit** coordinates and controls the operations and activities taking place within a CPU core, such as retrieving data and instructions and passing them on to the ALU or FPU for execution. In other words, it directs the flow of electronic traffic within the core, much like a traffic cop controls the flow of vehicles on a roadway. Essentially, the control unit tells the ALU and FPU what to do and makes sure that everything happens at the right time in order for the appropriate processing to take place.

The **prefetch unit** orders data and instructions from cache or RAM based on the current task. The prefetch unit tries to predict what data and instructions will be needed and retrieves them ahead of time, in order to help avoid delays in processing.

The **decode unit** takes the instructions fetched by the prefetch unit and translates them into a form that can be understood by the control unit, ALU, and FPU. The decoded instructions go to the control unit for processing.

The **bus interface unit** allows the core to communicate with other CPU components, such as the memory controller and other cores. As previously mentioned, the memory controller controls the flow of instructions and data going between the CPU cores and RAM.

PTS: 1 REF: 41-42 TOP: Critical Thinking

3. What is RFID technology? What are its advantages and disadvantages?

ANS:
Radio frequency identification (**RFID**) is a technology that can store, read, and transmit data located in RFID tags. **RFID tags** contain tiny chips and radio antennas (see Exhibit 2-32); they can be attached to objects, such as products, price tags, shipping labels, ID cards, assets (such as livestock, vehicles, computers, and other expensive equipment), and more.

The data in RFID tags is read by **RFID readers**. Whenever an RFID-tagged item is within range of an RFID reader (from two inches to up to 300 feet or more, depending on the type of tag and the frequency being used), the tag's built-in antenna allows the information located within the RFID tag to be sent to the reader.

Because RFID technology can read numerous items at one time, it is also possible that, someday, RFID will allow a consumer to perform self-checkout at a retail store by just pushing a shopping cart past an RFID reader, which will ring up all items in the cart at one time. RFID is used today for many different applications (Exhibit 2-33 shows some examples).

Despite all its advantages, a number of privacy and security issues need to be resolved before RFID gains widespread use at the consumer level. Precautions against fraudulent use—such as using high-frequency tags that need to be within a few inches of the reader, and requiring a PIN code, a signature, or another type of authorization when an RFID payment system is used—are being developed. Currently, a price limit (such as $25) for completely automated purchases (without a signature or other authorization) is being debated as a compromise between convenience and security. Privacy advocates are concerned about linking RFID tag data with personally identifiable data contained in corporate databases, such as to track consumer movements or shopping habits. As of now, no long-term solution to this issue has been reached.

PTS: 1 REF: 61-62 TOP: Critical Thinking