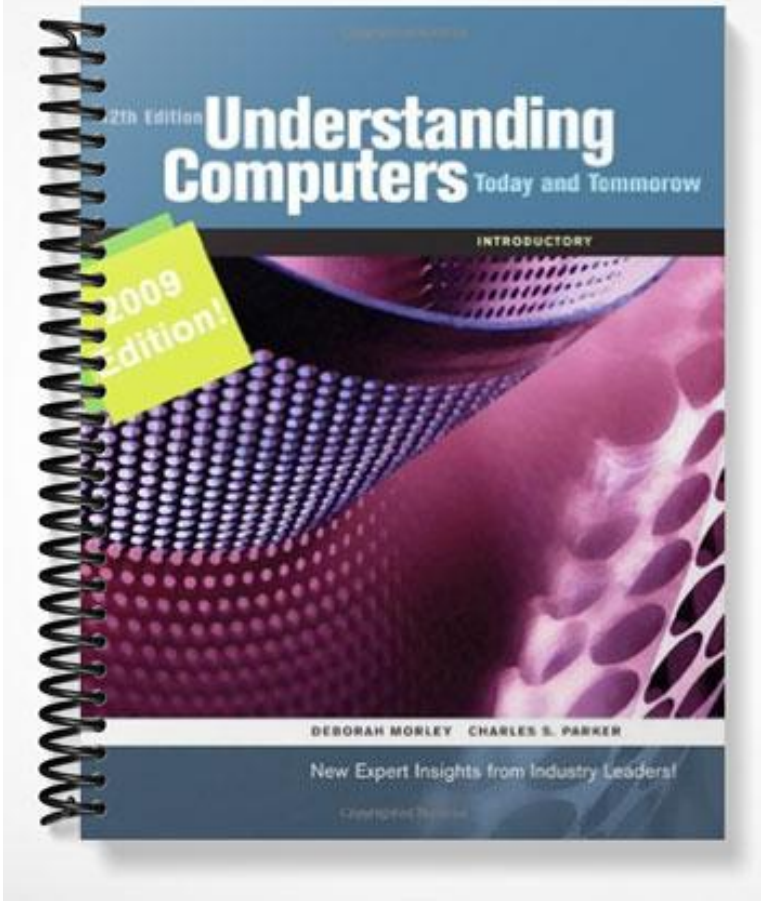
TEST BANK


12th Edition
Understanding Computers
Today and Tommorow
INTRODUCTORY
2009 Edition!
DEBORAH MORLEY CHARLES S. PARKER
New Expert Insights from Industry Leaders!

TRUE/FALSE

1. The process of representing data in digital form so it can be used by a digital computer is called decimal byte representation.

   ANS: F PTS: 1 REF: 57

2. The binary numbering system uses only two symbols—the digits 0 and 1—to represent all possible numbers.

   ANS: T PTS: 1 REF: 58

3. Unlike ASCII, Unicode is a universal coding standard designed to represent text-based data written in any language, including those with different alphabets.

   ANS: T PTS: 1 REF: 60

4. To convert analog sound to digital sound, several thousand samples—digital representations of the sound at a particular moment—are taken every second.

   ANS: T PTS: 1 REF: 63

5. Early computers required programs to be written in machine language.

   ANS: T PTS: 1 REF: 63

6. The main circuit board inside the system unit is called the megaboard or system board.

   ANS: F PTS: 1 REF: 64

7. ROM (read-only memory), also called main memory, is used to store the essential parts of the operating system while the computer is running.

   ANS: F PTS: 1 REF: 70

8. Each location in memory has an address.

   ANS: T PTS: 1 REF: 72

9. Most desktop PCs have expansion drives located on the motherboard into which expansion cards can be inserted.

   ANS: F PTS: 1 REF: 74

10. The backside bus (BSB) has been one of the most common types of expansion buses in past years.

    ANS: F PTS: 1 REF: 75

11. Some of the oldest types of ports—such as serial and parallel ports—are increasingly being referred to as standard ports.

ANS: F PTS: 1 REF: 78

12. Serial ports typically connect nearby printers to a PC.

ANS: F PTS: 1 REF: 78

13. One type of port found on notebook computers but not on desktop PCs is a port used to connect a port stopper.

ANS: F PTS: 1 REF: 79

14. The control 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.

ANS: F PTS: 1 REF: 82

15. The decode unit coordinates and controls the operations and activities taking place within the CPU.

ANS: F PTS: 1 REF: 82

16. As a hard drive begins to get full, it takes less time to locate and manipulate the data stored on the drive.

ANS: F PTS: 1 REF: 86

17. As long as you are sure that none of the files in the Recycle Bin need to be restored, those files are taking up room on your hard drive needlessly.

ANS: T PTS: 1 REF: 86

18. SOI chips use a thin layer of insulating material over the silicon to reduce heat and power consumption.

ANS: T PTS: 1 REF: 88

19. Pipelining increases the number of machine cycles completed per second.

ANS: T PTS: 1 REF: 89

20. SMP systems are typically more difficult to program than MPP systems.

ANS: F PTS: 1 REF: 90

MODIFIED TRUE/FALSE

1. ASCII is the coding system traditionally used with PCs. _____

ANS: T PTS: 1 REF: 60

2. Because of its large size, when audio data is transmitted over the Internet it is often encrypted to shorten the download time. _____

ANS: F, compressed

PTS: 1 REF: 63

3. The system unit is the main case of a computer. _____

ANS: T PTS: 1 REF: 64

4. The CPU—also called the microprocessor or just the board—does the vast majority of the processing for a computer. _____

ANS: F, processor

PTS: 1 REF: 65

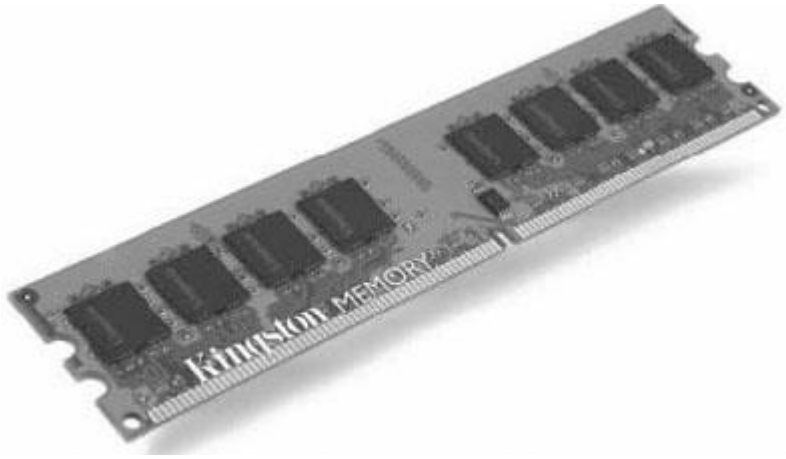
5. Benchmark tests typically run the same series of programs on several computer systems that are identical except for the CPU and measure how long each task takes to determine the overall relative performance of the CPUs being tested. _____

ANS: T PTS: 1 REF: 68

6. "Memory" refers to the amount of long-term storage available to a PC. _____

ANS: F, Storage

PTS: 1 REF: 69



7. The accompanying figure shows a DIMM RAM microprocessor. _____

ANS: F, memory module

PTS: 1 REF: 71

8. The buses used to connect peripheral (typically input and output) devices are usually referred to as expansion buses. _____

ANS: T PTS: 1 REF: 74

9. Single ports use very inexpensive cables, and they can send data over long distances reliably. _____

   ANS: F, Serial ports

   PTS: 1 REF: 78

10. The keyboard port and the mouse port typically use a(n) PS/2 connector and can be used to connect the keyboard and mouse to the system unit. _____

    ANS: T PTS: 1 REF: 78

11. Today's CPUs contain hundreds of millions of transistors, and the number doubles approximately every 18 months, a phenomenon known as Moliere's Law. _____

    ANS: F, Moore's Law

    PTS: 1 REF: 80

12. Each machine language instruction in a CPU's instruction set is broken down into several smaller, machine-level instructions called supercode. _____

    ANS: F, microcode

    PTS: 1 REF: 83

13. Registers are used to hold the results of processing. _____

    ANS: T PTS: 1 REF: 83

14. With pipelining, a new instruction begins executing as soon as the previous one reaches the next stage of the pipeline. _____

    ANS: T PTS: 1 REF: 89

15. With MPP, a single copy of the operating system is in charge of all the processors and the processors share memory. _____

    ANS: F
    SMP
    symmetric multiprocessing

    PTS: 1 REF: 89-90

MULTIPLE CHOICE

1. There are ____ that are used to represent numeric, text-based, and multimedia data, as well as to represent computer programs.
   a. coding tables
   b. operating systems
   c. coding systems
   d. operating schemes

   ANS: C PTS: 1 REF: 57

2. Coding systems are also called ____.
   a. coding tables
   b. coding schemes
   c. operating systems
   d. operating schemes

   ANS: B PTS: 1 REF: 57

3. A ____ is equal to 1,024 bytes.
   a. kilobyte (KB)
   b. megabyte (MB)
   c. gigabyte (GB)
   d. terabyte (TB)

   ANS: A PTS: 1 REF: 58

4. Each place value in a binary number represents ____ taken to the appropriate power.
   a. 0
   b. 1
   c. 2
   d. 10

   ANS: C PTS: 1 REF: 59

5. With bitmapped images, the color of each ____ is represented by bits; the more bits used, the better the image quality.
   a. pixel
   b. vector
   c. map
   d. byte

   ANS: A PTS: 1 REF: 62

6. In a 16.8-million-color (called photographic quality or ____) image, 3 bytes (24 bits) are used to store the color data for each pixel in the image.
   a. mega color
   b. true color
   c. real color
   d. full color

   ANS: B PTS: 1 REF: 62

7. Like graphics data, ____—such as a song or the sound of someone speaking—must be in digital form in order to be stored on a storage medium or processed by a PC.
   a. pixel data
   b. giga data
   c. audio data
   d. audio programs

   ANS: C PTS: 1 REF: 63

8. Video data—such as home movies, feature films, and television shows—is displayed using a collection of ____.
   a. slides
   b. pixels
   c. vectors
   d. frames

   ANS: D PTS: 1 REF: 63

9. A(n) ____ instruction might look like a meaningless string of 0s and 1s, but it actually represents specific operations and storage locations.
   a. COBOL language
   b. ASCII
   c. programming language
   d. machine language

   ANS: D PTS: 1 REF: 63

10. ____ are very small pieces of silicon or other semiconducting material onto which integrated circuits are embedded.
    a. Pixels
    c. Chips

b. Pentiums
d. Motherboards

ANS: C PTS: 1 REF: 64

11. One measurement of the speed of a CPU is the ____, which is rated in megahertz (MHz) or gigahertz (GHz).
a. system speed
c. system rpm
b. CPU clock speed
d. CPU rpm

ANS: B PTS: 1 REF: 67

12. A computer ____ is the amount of data (measured in bits or bytes) that a CPU can manipulate at one time.
a. word
c. statement
b. character
d. unit

ANS: A PTS: 1 REF: 68

13. A ____ is an electronic path over which data can travel.
a. bus
c. word
b. lane
d. cache memory

ANS: A PTS: 1 REF: 69

14. The bus width and bus speed together determine the bus's ____ or bandwidth; that is, the amount of data that can be transferred via the bus in a given period of time.
a. clock speed
c. machine cycle
b. throughput
d. memory

ANS: B PTS: 1 REF: 69

15. The term ____ refers to chip-based storage used by the computer.
a. storage media
c. hard drive
b. memory
d. Zip drive

ANS: B PTS: 1 REF: 69

16. An emerging type of RAM is magnetic (or more precisely, ____) (MRAM).
a. magnetoselective
c. magnetoresistive
b. magnetobalanced
d. magnetocharged

ANS: C PTS: 1 REF: 71

17. ____ is a type of nonvolatile memory into which data can be stored and retrieved.
a. RAM
c. SDRAM
b. Register
d. Flash memory

ANS: D PTS: 1 REF: 72

18. ____ have begun to replace ROM for storing system information, such as a PC's BIOS.
a. Motherboards
c. Adapter cards
b. Microprocessors
d. Flash memory chips

ANS: D PTS: 1 REF: 72

19. The bus that moves data back and forth between the CPU and memory is typically called the ____.
a. system memory
c. expansion bus

b. operating bus
d. system bus

ANS: D PTS: 1 REF: 74

20. ____ transport bits and bytes from one component to another, including the CPU, cache, RAM, and peripheral devices.
a. Ports
c. Buses
b. ROMS
d. Cards

ANS: C PTS: 1 REF: 76

21. The ____ enables up to 127 devices to be connected to a computer's PCI bus through a single port on the computer's system unit.
a. HyperTransport bus
c. AGP (Accelerated Graphics Port) bus
b. USB standard
d. PCI Express Bus

ANS: B PTS: 1 REF: 76

22. Most computers today support the ____ standard, in which the computer automatically configures new devices as soon as they are installed and the PC is powered up.
a. Plug and Play
c. Serial port
b. Match
d. Parallel port

ANS: A PTS: 1 REF: 78

23. Most network cards contain a port that accepts a(n) ____, which looks similar to a telephone connector but is larger.
a. RJ-11 connector
c. RJ-14 connector
b. RJ-12 connector
d. RJ-45 connector

ANS: D PTS: 1 REF: 78

24. The key element of the microprocessor is the ____—a device made of semiconductor material that acts like a switch controlling the flow of electrons inside a chip.
a. processor
c. chipbus
b. transistor
d. S-card

ANS: B PTS: 1 REF: 80

25. The ____ is the section of the CPU that performs arithmetic involving integers and logical operations.
a. register
c. arithmetic/logic unit (ALU)
b. decode unit
d. internal cache

ANS: C PTS: 1 REF: 81

26. The ____ is the section of the CPU that performs arithmetic involving integers and logical operations.
a. FPU
c. decode unit
b. control unit
d. ALU

ANS: D PTS: 1 REF: 81

27. The ____ orders data and instructions from cache or RAM based on the task at hand.
a. ALU
c. control unit
b. prefetch unit
d. decode unit

ANS: B PTS: 1 REF: 82

28. The ____ tries to predict what data and instructions will be needed and retrieves them ahead of time, in order to help avoid delays in processing.
    a. control unit
    b. floating point unit
    c. arithmetic/logic unit
    d. prefetch unit

    ANS: D PTS: 1 REF: 82

29. Instructions and data flow in and out of the CPU via the ____.
    a. control unit
    b. prefetch unit
    c. decode unit
    d. bus interface unit

    ANS: D PTS: 1 REF: 83

30. In order to synchronize the computer's operations, a ____—a quartz crystal located on the motherboard—is used.
    a. cycle chip
    b. fetch unit
    c. system clock
    d. microprocessor

    ANS: C PTS: 1 REF: 83

31. Some ____ must be added in pairs.
    a. interfaces
    b. memory modules
    c. USB ports
    d. hard drives

    ANS: B PTS: 1 REF: 85

32. Today's CPUs are formed using a process called ____ that imprints patterns on semiconductor materials.
    a. vectoring
    b. lithography
    c. serigraphy
    d. imprintment

    ANS: B PTS: 1 REF: 87

33. A USB ____ is a device that plugs into your PC's USB port to convert one port into several USB ports.
    a. hub
    b. module
    c. bus
    d. connector

    ANS: A PTS: 1 REF: 79

34. One nanometer (nm) is ____ of a meter.
    a. one-billionth
    b. one-millionth
    c. one-thousandth
    d. one-tenth

    ANS: A PTS: 1 REF: 90

35. Terascale computing is the ability of computers to process one ____ floating-point operations per second (teraflops).
    a. million
    b. billion
    c. trillion
    d. quadrillion

    ANS: C PTS: 1 REF: 93

Case-Based Critical Thinking Questions

Case 2-1

Jess is a musician who has just bought a new computer. Now she has to determine how to connect this computer to the devices that were connected to her old computer.

36. To connect her printer directly to the computer, Jess needs to use the ____ port.
    a. serial
    b. parallel
    c. network
    d. modem

    ANS: B PTS: 1 REF: 78 TOP: Critical Thinking

37. Jess has a music keyboard that she uses to compose music that will be stored electronically. To connect the keyboard to the computer, she would use the ____ port.
    a. SCSI
    b. FireWire
    c. modem
    d. MIDI

    ANS: D PTS: 1 REF: 79 TOP: Critical Thinking

Case-Based Critical Thinking Questions

Case 2-2
Jack has a computer at home that he uses to access the Internet, store and edit personal photos, and create and edit documents. Recently, he has come to realize that in order to keep the computer performing at its best, he needs to carry out regular system maintenance on the computer.

38. Jack has many large files such as digital photos and movies stored on his computer. Since he only occasionally uses these files, he should consider moving them to a removable storage medium, such as a CD disc, DVD disc, or ____.
    a. RAM memory module
    b. USB hub
    c. USB flash drive
    d. FireWire disk

    ANS: C PTS: 1 REF: 86 TOP: Critical Thinking

39. Jack can use a ____ program, such as the Windows Disk Defragmenter program, to arrange the files on his hard drive more efficiently.
    a. utility
    b. browser
    c. Recycle Bin
    d. USB

    ANS: A PTS: 1 REF: 86 TOP: Critical Thinking

40. To access the Internet, Jack uses Internet Explorer. To delete the temporary files stored by Internet Explorer, he can choose Internet Options from the ____ menu of the browser.
    a. File
    b. Edit
    c. View
    d. Tools

    ANS: D PTS: 1 REF: 86 TOP: Critical Thinking

COMPLETION

1. Text-based data is represented by fixed-length binary coding systems specifically developed for text-based data—namely, ASCII, EBCDIC, and _____.

   ANS: Unicode

   PTS: 1 REF: 59

2. One of the most common methods for storing graphics data is in the form of a bitmap—a grid of hundreds of thousands of dots, called _____.

   ANS: pixels

   PTS: 1 REF: 61

3. Although bitmapped images are widely used, they are not the best choice when images need to be resized because the existing _____ are just made larger or smaller (no new ones are added).

   ANS: pixels

   PTS: 1 REF: 61

4. A(n) _____ is a thin board containing chips and other electronic components.

   ANS: circuit board

   PTS: 1 REF: 64

5. _____ is a special group of very fast memory chips located on or close to the CPU.

   ANS: Cache memory

   PTS: 1 REF: 68

6. Like the CPU, RAM consists of circuits etched onto chips. These chips are arranged onto circuit boards called _____.

   ANS: memory modules

   PTS: 1 REF: 70

7. Flash memory chips used for storage are either built directly into a device or incorporated into removable _____ or USB flash drives.

   ANS: flash memory cards

   PTS: 1 REF: 73

8. Expansion buses either connect the CPU directly to _____ on the system unit case or to expansion slots on the motherboard.

   ANS: ports

   PTS: 1 REF: 74-75

9. _____ are the connectors located on the exterior of the system unit that are used to connect external hardware devices.

   ANS: Ports

   PTS: 1 REF: 77

10. _____ connectors typically have 9 or 25 pins and are referred to as DB-9 or DB-25 connectors, respectively.

    ANS: Serial

    PTS: 1 REF: 78

11. The accompanying figure shows a(n) _____.

    ANS: USB hub

    PTS: 1 REF: 79

12. A(n) _____ port is used to connect a joystick, game pad, steering wheel, or other device commonly used with computer gaming programs.

    ANS: game

    PTS: 1 REF: 79

13. Most handheld PCs and smart phones have at least a(n) _____-compatible expansion slot for expansion.

    ANS:
    SD
    Secure Digital
    Secure Digital (SD)

    PTS: 1 REF: 79-80

14. The _____ coordinates and controls the operations and activities taking place within the CPU, such as retrieving data and instructions and passing them on to the ALU or FPU for execution.

    ANS: control unit

    PTS: 1 REF: 82

15. The _____ connects the CPU to the system bus so it can communicate with external cache, RAM, and the rest of the computer.

ANS: bus interface unit

PTS: 1 REF: 83

16. Most computers today can process more than one piece of microcode at one time—a characteristic known as _____ or being able to process multiple instructions per cycle (IPC).

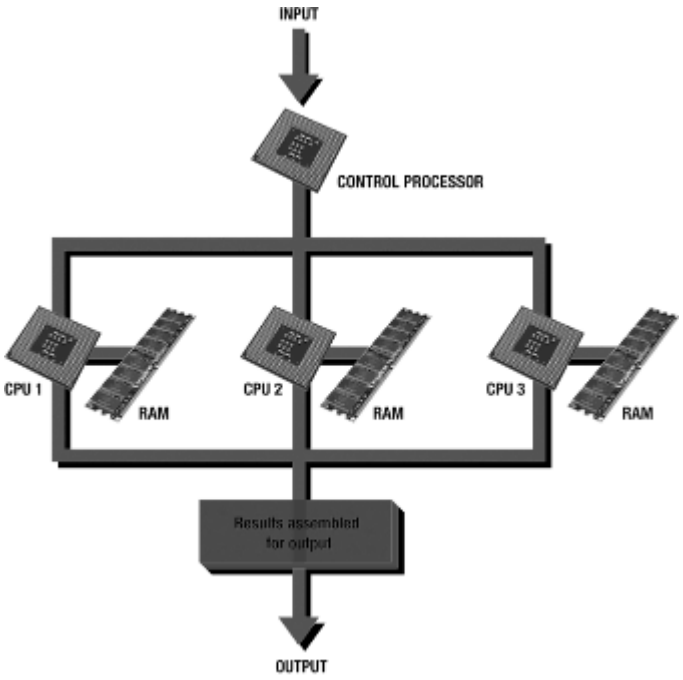
ANS: superscalar

PTS: 1 REF: 83

17. As large documents are stored, retrieved, and then stored again, they often become _____—that is, not stored in contiguous (adjacent) storage areas.

ANS: fragmented

PTS: 1 REF: 86



18. The above figure illustrates _____ processing.

ANS: parallel

PTS: 1 REF: 90

19. _____ are tiny, hollow tubes made up of carbon atoms.

ANS: Carbon nanotubes

PTS: 1 REF: 91

20. _____ applies the principles of quantum physics and quantum mechanics to computers, going beyond traditional physics to work at the subatomic level.

    ANS: Quantum computing

    PTS: 1 REF: 91

ESSAY

1. Explain what a register is and how it is used.

   ANS:
   A register is high-speed memory built into the CPU. Registers are used by the CPU to temporarily store data and intermediary results during processing. Registers are the fastest type of memory used by the CPU, even faster than Level 1 cache. Generally, the more data a register can contain at one time, the faster the CPU performs.

   PTS: 1 REF: 72 TOP: Critical Thinking

2. What does ROM (read-only memory) consist of? What is one important difference between ROM and RAM (random access memory)?

   ANS:
   ROM (read-only memory) consists of nonvolatile chips that permanently store data or programs. Like RAM, these chips are attached to the motherboard inside the system unit, and the data or programs are retrieved by the computer when they are needed. An important difference, however, is that you can neither write over the data or programs in ROM chips (which is the reason ROM chips are called *read-only*), nor destroy their contents when you shut off the computer's power.

   PTS: 1 REF: 72 TOP: Critical Thinking

3. What are the general operations a machine cycle consists of?

   ANS:
   Each machine cycle consists of the following four general operations:
   1. Fetch—the program instruction is fetched.
   2. Decode—the instructions are decoded so the control unit, ALU, and FPU can understand them.
   3. Execute—the instructions are carried out.
   4. Store—the original data or the result from the ALU or FPU execution is stored either in the CPU's registers or in memory, depending on the instruction.

   PTS: 1 REF: 83-85 TOP: Critical Thinking

4. Explain the difference between multiprocessing and parallel processing.

   ANS:
   With multiprocessing, each CPU typically works on a different job. Because multiple jobs are being processed simultaneously, they are completed faster than with a single processor. With parallel processing, multiple processors work together to make one single job finish sooner; a control processor assigns a portion of the processing for that job to each CPU.

   PTS: 1 REF: 89 TOP: Critical Thinking

5. Describe how Hyper-Threading Technology works.

   ANS:
   Hyper-Threading Technology is a technology developed by Intel to enable software to treat a single processor as two processors. Since it utilizes processing power in the chip that would otherwise go unused, this technology lets the chip operate more efficiently, resulting in faster processing, provided the software being used supports Hyper-Threading.

   PTS: 1 REF: 90 TOP: Critical Thinking