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Name:_____ Class:_____ Date:_____

Chapter 02: The System Unit: Processing and Memory

1. The process of representing data in a form that can be understood by a digital computer is called decimal byte representation.
   a. True
   b. False
ANSWER: False
POINTS: 1
REFERENCES: 52

2. The binary numbering system uses only two symbols—the digits 0 and 1—to represent all possible numbers.
   a. True
   b. False
ANSWER: True
POINTS: 1
REFERENCES: 52

3. Unlike ASCII and EBCDIC, Unicode is a universal international coding standard designed to represent text-based data written in any ancient or modern language, including those with different alphabets.
   a. True
   b. False
ANSWER: True
POINTS: 1
REFERENCES: 54

4. Each pixel in a monochrome graphic can be only one of two possible colors (such as black or white).
   a. True
   b. False
ANSWER: True
POINTS: 1
REFERENCES: 55

5. To convert analog sound to digital sound, several thousand samples—digital representations of the sound at a particular moment—are taken every second.
   a. True
   b. False
ANSWER: True
POINTS: 1
REFERENCES: 55

6. Early computers required programs to be written in machine language.
   a. True
   b. False
ANSWER: True
POINTS: 1
REFERENCES: 56

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7. The main circuit board inside the system unit is called the megaboard.
   a. True
   b. False

ANSWER: False
POINTS: 1
REFERENCES: 56

8. The number of bits being transmitted at one time is dependent on the bus width.
   a. True
   b. False

ANSWER: True
POINTS: 1
REFERENCES: 62

9. ROM (read-only memory), also called main memory or system memory, is used to store the essential parts of the operating system while the computer is running.
   a. True
   b. False

ANSWER: False
POINTS: 1
REFERENCES: 62

10. Each location in memory has an address.
   a. True
   b. False

ANSWER: True
POINTS: 1
REFERENCES: 64

11. Some basic capabilities are often integrated directly into the motherboard instead of requiring the use of an expansion card.
   a. True
   b. False

ANSWER: True
POINTS: 1
REFERENCES: 67

12. The backside bus (BSB) has been one of the most common types of expansion buses in past years.
   a. True
   b. False

ANSWER: False
POINTS: 1
REFERENCES: 69

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13. Several of the original ports used with desktop computers—such as the parallel ports traditionally used to connect printers—are now considered standard ports.

a. True

b. False

ANSWER: False
POINTS: 1
REFERENCES: 70

14. USB ports are used to connect a computer to a phone outlet via telephone connectors.

a. True

b. False

ANSWER: False
POINTS: 1
REFERENCES: 70

15. Thunderbolt ports are used to receive wireless transmissions from devices.

a. True

b. False

ANSWER: False
POINTS: 1
REFERENCES: 71

16. The decode unit coordinates and controls the operations and activities taking place within a CPU core.

a. True

b. False

ANSWER: False
POINTS: 1
REFERENCES: 74

17. 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.

a. True

b. False

ANSWER: False
POINTS: 1
REFERENCES: 75

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

a. True

b. False

ANSWER: False
POINTS: 1
REFERENCES: 77

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19. Pipelining increases the number of machine cycles completed per second.
    a. True
    b. False

ANSWER: True
POINTS: 1
REFERENCES: 79

20. To create 3D RAM or flash memory chips, the memory cells are stacked on top of one another in layers.
    a. True
    b. False

ANSWER: True
POINTS: 1
REFERENCES: 82

21. ASCII is the coding system traditionally used with personal computers. _____

ANSWER: True
POINTS: 1
REFERENCES: 54

22. Most recent software programs, including the latest versions of Microsoft Windows, OS X, and Microsoft Office, use ASCII. _____

ANSWER: False - Unicode
POINTS: 1
REFERENCES: 54

23. Because of its large size, audio data is usually encrypted to reduce its file size when it is transmitted over the Internet or stored on a smartphone or another device. _____

ANSWER: False - compressed
POINTS: 1
REFERENCES: 55

24. The system unit is the main case of a computer or mobile device. _____

ANSWER: True
POINTS: 1
REFERENCES: 56

25. Processors consist of a variety of circuitry and components that are packaged together and connected directly to the motherboard. _____

ANSWER: True
POINTS: 1
REFERENCES: 58

26. Single-core CPUs allow computers to work simultaneously on more than one task at a time. _____

ANSWER: False - Multi-core CPUs

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POINTS: 1
REFERENCES: 58

27. Benchmark tests typically run the same series of programs on several computer systems that are identical except for one component (such as the CPU) and measure how long each task takes in order to determine the overall relative performance of the component being tested. _____
ANSWER: True
POINTS: 1
REFERENCES: 60-61

28. Cache memory today is usually external cache. _____
ANSWER: False - internal
POINTS: 1
REFERENCES: 61

29. There are buses inside the CPU, as well as on the memory channel. _____
ANSWER: False - motherboard
POINTS: 1
REFERENCES: 62

30. RAM capacity is measured in bits. _____
ANSWER: False - bytes
POINTS: 1
REFERENCES: 63

31. The buses that connect peripheral (typically input and output) devices to the motherboard are often called expansion buses. _____
ANSWER: True
POINTS: 1
REFERENCES: 68

32. To help you identify USB 3 ports, they are colored red. _____
ANSWER: False - blue
POINTS: 1
REFERENCES: 69

33. Today's CPUs contain hundreds of millions of transistors, and the number doubles approximately every 18 months, a phenomenon known as Moliere's Law. _____
ANSWER: False - Moore's Law
POINTS: 1
REFERENCES: 73

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

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POINTS: 1
REFERENCES: 75

35. With pipelining, a new instruction begins executing as soon as the previous one reaches the next stage of the pipeline.
_____
ANSWER: True
POINTS: 1
REFERENCES: 79

36. A ____ is the smallest unit of data that a binary computer can recognize.
a. byte b. datum
c. pixel d. bit
ANSWER: d
POINTS: 1
REFERENCES: 52

37. Eight bits grouped together are collectively referred to as a ____.
a. kilobit b. byte
c. pixel d. binary
ANSWER: b
POINTS: 1
REFERENCES: 52

38. A ____ is approximately 1,000 bytes.
a. kilobyte (KB) b. megabyte (MB)
c. gigabyte (GB) d. terabyte (TB)
ANSWER: a
POINTS: 1
REFERENCES: 52

39. The numbering system we commonly use is called the decimal numbering system because it uses ____ symbols to represent all possible numbers.
a. 2 b. 5
c. 10 d. 16
ANSWER: c
POINTS: 1
REFERENCES: 52

40. Each place value in a binary number represents ____ raised to the appropriate power.
a. 0 b. 1
c. 2 d. 10
ANSWER: c
POINTS: 1
REFERENCES: 53

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41. 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
ANSWER: a
POINTS: 1
REFERENCES: 55

42. The JPEG images taken by most digital cameras today use 24-bit ____.
a. mega color images b. true color images
c. real color images d. full color images
ANSWER: b
POINTS: 1
REFERENCES: 55

43. 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 computer.
a. pixel data b. giga data
c. audio data d. audio programs
ANSWER: c
POINTS: 1
REFERENCES: 55

44. Video data—such as home movies, feature films, video clips, and television shows—is displayed using a collection of ____.
a. slides b. pixels
c. vectors d. frames
ANSWER: d
POINTS: 1
REFERENCES: 56

45. 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
ANSWER: d
POINTS: 1
REFERENCES: 56

46. A circuit board is a thin board containing ____ and other electronic components.
a. pixels b. pentiums
c. computer chips d. computer bits
ANSWER: c
POINTS: 1
REFERENCES: 56

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47. One measurement of the speed of a CPU is the ____, which is rated in megahertz (MHz) or gigahertz (GHz).
a. system speed b. CPU clock speed
c. system rpm d. CPU rpm
ANSWER: b
POINTS: 1
REFERENCES: 60

48. A computer ____ is the amount of data (typically measured in bits or bytes) that a CPU can manipulate at one time.
a. word b. character
c. statement d. unit
ANSWER: a
POINTS: 1
REFERENCES: 61

49. A ____ is an electronic path over which data can travel.
a. bus b. lane
c. word d. cache memory
ANSWER: a
POINTS: 1
REFERENCES: 62

50. The bus width and bus speed together determine the bus's ____.
a. clock speed b. bandwidth
c. machine cycle d. memory
ANSWER: b
POINTS: 1
REFERENCES: 62

51. The term ____ refers to chip-based storage.
a. storage media b. memory
c. hard drive d. zip drive
ANSWER: b
POINTS: 1
REFERENCES: 62

52. Magnetic RAM (MRAM) uses ____ rather than an electrical charge to store data.
a. memristors b. three layers
c. magnetic polarization d. carbon nanotubes
ANSWER: c
POINTS: 1
REFERENCES: 64

53. ____ consists of nonvolatile memory chips that can be used for storage by the computer or the user.
a. RAM b. Register

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c. SDRAM d. Flash memory

ANSWER: d
POINTS: 1
REFERENCES: 65

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

ANSWER: d
POINTS: 1
REFERENCES: 65

55. ____ are small components typically made out of aluminum with fins that help to dissipate heat.
a. ACs b. Fans
c. Heat buses d. Heat sinks

ANSWER: d
POINTS: 1
REFERENCES: 65

56. The ____ allows 127 different devices to connect to a computer via a single USB port on the computer's system unit.
a. HyperTransport bus b. USB standard
c. AGP (Accelerated Graphics Port) bus d. PCI Express Bus

ANSWER: b
POINTS: 1
REFERENCES: 69

57. Network ports are used to connect a computer to a computer network via a networking cable—typically a cable using a(n) ____, which looks similar to a telephone connector but is larger.
a. RJ-11 connector b. RJ-12 connector
c. RJ-14 connector d. RJ-45 connector

ANSWER: d
POINTS: 1
REFERENCES: 70

58. To connect multiple USB devices to a single USB port, a ____ can be used.
a. USB hub b. module
c. USB bus d. connector

ANSWER: a
POINTS: 1
REFERENCES: 70

59. Most computers today support the ____ standard, which means the computer automatically configures new devices as soon as they are installed and the computer is powered up.
a. Plug and Play b. Match

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c. Serial port d. Parallel port

ANSWER: a
POINTS: 1
REFERENCES: 71

60. The key element of the microprocessor is the ____—a device made of semiconductor material that controls the flow of electrons inside a chip.

a. processor b. transistor
c. chipbus d. S-card

ANSWER: b
POINTS: 1
REFERENCES: 73

61. The ____ takes instructions from the prefetch unit and translates them into a form that the control unit can understand.

a. register b. decode unit
c. ALU d. internal cache

ANSWER: b
POINTS: 1
REFERENCES: 73

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

a. FPU b. control unit
c. decode unit d. ALU

ANSWER: d
POINTS: 1
REFERENCES: 74

63. The ____ orders data and instructions from cache or RAM based on the current task.

a. ALU b. prefetch unit
c. control unit d. decode unit

ANSWER: b
POINTS: 1
REFERENCES: 75

64. 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

ANSWER: d
POINTS: 1
REFERENCES: 75

65. The ____ allows a core to communicate with other CPU components, such as the memory controller and other cores.

a. control unit b. prefetch unit

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c. decode unit d. bus interface unit
ANSWER: d
POINTS: 1
REFERENCES: 75

66. To synchronize all of a computer's operations, a ____, which is located on the motherboard, is used.
a. cycle chip b. fetch unit
c. system clock d. microprocessor
ANSWER: c
POINTS: 1
REFERENCES: 75

67. One reason a computer might become inefficient is that when programs are uninstalled, pieces of the program are sometimes left behind or references to these programs are left in operating system files such as the ____.
a. Windows defender b. Windows registry
c. kernel d. Security Accounts Manager (SAM)
ANSWER: b
POINTS: 1
REFERENCES: 77

68. Today's CPUs are formed using a process called ____ that imprints patterns on semiconductor materials.
a. vectoring b. lithography
c. serigraphy d. imprintment
ANSWER: b
POINTS: 1
REFERENCES: 81

69. One nanometer (nm) is ____ of a meter.
a. one-billionth b. one-millionth
c. one-thousandth d. one-tenth
ANSWER: a
POINTS: 1
REFERENCES: 81

70. Terascale computing is the ability of a computer to process one ____ floating point operations per second (teraflops).
a. million b. billion
c. trillion d. quadrillion
ANSWER: c
POINTS: 1
REFERENCES: 84

Case-Based Critical Thinking Questions

Case 2-1
Jess is a musician who has just bought a new computer. Now she need to figure out how to connect this computer to the

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devices that were connected to her old computer.

71. Jess has pictures from her old computer saved on a flash memory card. To transfer these to her new computer, she will insert the card into a(n) ____.

a. SCSI port b. IrDA port
c. modem d. slot

ANSWER: d
POINTS: 1
REFERENCES: 71
TOPICS: Critical Thinking

72. To connect her external hard drive, in which all of her music files are stored, to the computer, Jess needs to use a ____.

a. serial port b. USB port
c. network antenna d. modem cable

ANSWER: b
POINTS: 1
REFERENCES: 71
TOPICS: 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.

73. Jack can use the ____ program to locate and delete temporary files, such as installation files, Web browsing history, and files in the Recycle Bin.

a. Windows Registry b. Disk Defragmenter
c. Temporary Files d. Windows Disk Cleanup

ANSWER: d
POINTS: 1
REFERENCES: 78
TOPICS: Critical Thinking

74. Since Jack has a Windows system, he can right-click a hard drive icon in File Explorer, select Properties, and then select the ____ option on the Tools tab to check that hard drive for errors.

a. Check b. Disk Defragmenter
c. Defragment now d. Windows Disk Cleanup

ANSWER: a
POINTS: 1
REFERENCES: 78
TOPICS: Critical Thinking

75. Jack can speed up his computer by scanning it for viruses and ____.

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a. mailware b. utilities
c. spyware d. icons

ANSWER: c
POINTS: 1
REFERENCES: 78
TOPICS: Critical Thinking

76. Unicode is updated regularly to add new characters and new languages not originally encoded—the most recent version is _____.
ANSWER: Unicode 8.0
POINTS: 1
REFERENCES: 54

77. _____ data consists of still images, such as photographs or drawings.
ANSWER: Graphics
POINTS: 1
REFERENCES: 54

78. One of the most common methods for storing graphics data is in the form of a bitmap image—an image made up of a grid of small dots, called _____, that are colored appropriately to represent an image.
ANSWER: pixels
POINTS: 1
REFERENCES: 54-55

79. Computer chips are also called _____.
ANSWER: integrated circuits (ICs)
ICs (integrated circuits)
integrated circuits
ICs
POINTS: 1
REFERENCES: 56

80. Integrated circuits contain interconnected components such as _____ that enable electrical current to perform particular functions.
ANSWER: transistors
POINTS: 1
REFERENCES: 56

81. The _____ inside a computer delivers electricity to the computer via a power cord.
ANSWER: power supply
POINTS: 1
REFERENCES: 57

82. Most CPUs today are _____ CPUs; that is, CPUs that contain the processing components or cores of multiple independent processors on a single CPU.

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ANSWER: multi-core
POINTS: 1
REFERENCES: 58

83. _____ is a special group of very fast memory circuitry usually built into the CPU.
ANSWER: Cache memory
POINTS: 1
REFERENCES: 61

84. Chips for servers and personal computers are typically arranged onto circuit boards called _____.
ANSWER: memory modules
POINTS: 1
REFERENCES: 63

85. _____ are locations on the motherboard into which expansion cards can be inserted to connect those cards to the motherboard.
ANSWER: Expansion slots
POINTS: 1
REFERENCES: 66

86. Expansion buses connect directly to _____ on the system unit case or to expansion slots on the motherboard.
ANSWER: ports
POINTS: 1
REFERENCES: 68-69

87. _____ are the connectors located on the exterior of a system unit that are used to connect external hardware devices.
ANSWER: Ports
POINTS: 1
REFERENCES: 70

88. _____ are growing in importance as an increasing number of computers and mobile devices are including only USB ports and not many of them.
ANSWER: USB hubs
POINTS: 1
REFERENCES: 70

89. The _____ controls the communication between the CPU cores and RAM.
ANSWER: memory controller
POINTS: 1
REFERENCES: 73

90. The _____ directs the flow of electronic traffic within the core, much like a traffic cop controls the flow of vehicles on a roadway.

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ANSWER: control unit
POINTS: 1
REFERENCES: 75

91. Virtually all CPUs today can process more than one piece of microcode at one time—a characteristic known as _____, which is the ability to process multiple instructions per cycle (IPC).
ANSWER: superscalar
POINTS: 1
REFERENCES: 76

92. As large documents are stored, retrieved, and then stored again, they often become _____—that is, not stored in contiguous (adjacent) storage areas.
ANSWER: fragmented
POINTS: 1
REFERENCES: 77

93. _____ is the lightest and strongest known material and is the best known conductor of electricity.
ANSWER: Graphene
POINTS: 1
REFERENCES: 81

94. _____ are tiny, hollow tubes made by rolling up sheets of graphene.
ANSWER: Carbon nanotubes (CNTs)
CNTs (carbon nanotubes)
Carbon nanotubes
CNTs
POINTS: 1
REFERENCES: 83

95. _____ computers differ from conventional computers in that they utilize atoms or nuclei working together as quantum bits or qubits.
ANSWER: Quantum
POINTS: 1
REFERENCES: 84

96. Explain what a register is and how it is used.
ANSWER: A register is high-speed memory built into the CPU. Registers are used by the CPU to store data and intermediary results temporarily during processing. Registers are the fastest type of memory used by the CPU, even faster than Level 1 cache. Generally, more registers and larger registers result in increased CPU performance. Most CPUs contain multiple registers.
POINTS: 1
REFERENCES: 65
TOPICS: Critical Thinking

97. Define ROM (read-only) memory. What is one important difference between ROM and RAM (random access memory)?

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ANSWER: 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 erase their content when you shut off the computer's power.

POINTS: 1

REFERENCES: 65

TOPICS: Critical Thinking

98. What are the general operations of a machine cycle?

ANSWER: 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.

POINTS: 1

REFERENCES: 76

TOPICS: Critical Thinking

99. Explain the difference between multiprocessing and parallel processing.

ANSWER: With multiprocessing, each processor or core typically works on a different job. With parallel processing, multiple processors work together to make one single job finish sooner.

POINTS: 1

REFERENCES: 80

TOPICS: Critical Thinking

100. Describe how Hyper-Threading Technology works.

ANSWER: Many Intel CPUs are capable of running 2 threads per core, so a 4-core CPU could simultaneously execute 8 threads, providing the software being used supported it. Because this technique (called Hyper-Threading Technology by Intel) utilizes processing power in the chip that would otherwise go unused, it lets the chip operate more efficiently, resulting in faster processing.

POINTS: 1

REFERENCES: 80

TOPICS: Critical Thinking

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