Name: _____ Class: _____ Date: _____

Chapter 02: Computers: The Machines Behind Computing

1. An object code must be translated into source code for a computer to be able to read and execute it.
   a. True
   b. False

ANSWER: False

2. The hardware component of a computer system consists of programs written in computer languages.
   a. True
   b. False

ANSWER: False

3. Both the arithmetic logic unit (ALU) and the control unit are part of the Basic Input/Output System.
   a. True
   b. False

ANSWER: False

4. A computer with a 32-bit processor can perform calculations with larger numbers and be more efficient with smaller numbers than a 64-bit system.
   a. True
   b. False

ANSWER: False

5. ENIAC is an example of a first-generation computer.
   a. True
   b. False

ANSWER: True

6. Very-large-scale integration (VLSI) circuits were introduced in the fifth-generation computers.
   a. True
   b. False

ANSWER: False

7. A byte is a single value of 0 or 1.
   a. True
   b. False

ANSWER: False

8. Extended ASCII is a data code that allows the representation of 1024 characters.
   a. True
   b. False

ANSWER: False

9. Computers can store massive amounts of data in small spaces.
   a. True
   b. False

ANSWER: True

10. The split keyboard was developed for better ergonomics.

a. True
b. False

ANSWER: True

11. Inkjet printers produce characters by projecting electrically charged droplets of ink onto paper that create an image.

a. True
b. False

ANSWER: True

12. In a network-attached storage (NAS), as the number of users increases, its performance increases.

a. True
b. False

ANSWER: False

13. A server is a set of programs for controlling and managing computer hardware and software.

a. True
b. False

ANSWER: False

14. A personal computer can perform a variety of tasks by using application software, which can be commercial software or software developed in house.

a. True
b. False

ANSWER: True

15. Sometimes, fourth-generation languages (4GLs) are called procedural languages.

a. True
b. False

ANSWER: False

16. A(n) _____ is a step-by-step direction for performing a specific task, which is written in a language the computer can understand.

a. array
b. server
c. cache
d. program

ANSWER: d

17. A _____ is a peripheral device for recording, storing, and retrieving information.

a. disk drive
b. motherboard

c. control unit
d. multiprocessor

ANSWER: a

18. A(n) _____ is an interface between a computer and a printer that enables the computer to transfer multiple bits of information to the printer simultaneously.
a. parallel port
b. serial port
c. arithmetic logic unit
d. control unit

ANSWER: a

19. A _____ is a link between devices connected to a computer.
a. motherboard
b. control unit
c. disk drive
d. bus

ANSWER: d

20. A(n) _____ is a communication interface through which information is transferred one bit at a time.
a. serial port
b. parallel port
c. extended capability port
d. enhanced parallel port

ANSWER: a

21. Beginning in the 1940s, first-generation computers used _____.
a. transistors
b. vacuum tube technology
c. integrated circuits
d. laser technology

ANSWER: b

22. Second-generation computers used _____.
a. vacuum tube technology
b. transistors
c. integrated circuits
d. laser technology

ANSWER: b

23. Third-generation computers introduced _____.
a. remote data entry
b. miniaturization

c. parallel processing
d. optical discs

ANSWER: a

24. Identify the drawback of silicon because of which computer designers concentrate on technologies that use gallium arsenide.
a. Silicon cannot be used for mass production of silicon devices.
b. Silicon cannot emit light and has speed limitations.
c. Silicon is very soft and fragile.
d. Silicon is very expensive.

ANSWER: b

25. An advantage of silicon over gallium arsenide is that _____.
a. it is less fragile than gallium arsenide
b. it survives much higher doses of radiation than gallium arsenide
c. it withstands higher temperatures than gallium arsenide
d. it emits light, whereas gallium arsenide does not

ANSWER: a

26. _____ means saving data in computer memory.
a. Stream
b. Retrieval
c. Syndication
d. Storage

ANSWER: d

27. The word *computer* consists of 64 bits, which is equivalent to _____ bytes.
a. 6
b. 8
c. 16
d. 32

ANSWER: b

28. A _____ is the size of a character.
a. nibble
b. bit
c. byte
d. word

ANSWER: c

29. Computers and communication systems use _____ to represent and transfer information between computers and network systems.
a. intranetos

b. light pens
c. data codes
d. prototypes

ANSWER: c

30. Identify the file in which each alphabetic, numeric, or special character is represented with a 7-bit binary number.
a. Extended Binary Code Decimal Interchange Code
b. Unicode
c. American Standard Code for Information Interchange
d. Extended ASCII

ANSWER: c

31. Every character, number, or symbol on the keyboard is represented as a _____ in computer memory.
a. index number
b. hexadecimal number
c. octal number
d. binary number

ANSWER: d

32. Extended ASCII data code allows representation of _____ characters.
a. 1042
b. 265
c. 256
d. 1024

ANSWER: c

33. An ASCII file defines up to _____ characters.
a. 8
b. 128
c. 258
d. 1024

ANSWER: b

34. A petabyte is equal to _____ bytes.
a. 2^{30}
b. 2^{40}
c. 2^{50}
d. 2^{60}

ANSWER: c

35. A _____ is a pointing device that moves the cursor on the screen, allowing fast, precise cursor positioning.
a. motherboard

b. keyboard
c. mouse
d. kernel

ANSWER: c

36. Trackballs are ideal for notebook computers because they _____.
a. occupy less space than a mouse
b. rely on light detection to determine which menu item has been selected
c. can be moved over a wider surface area
d. allow faster, more precise cursor positioning than a mouse

ANSWER: a

37. Which of the following is an input device?
a. Touch screen
b. Cathode ray tube
c. Liquid crystal display
d. Inkjet printer

ANSWER: a

38. Identify an advantage of using a mouse over a trackball.
a. The size of a mouse is smaller than that of a trackball.
b. Positioning with a mouse is more precise than with a trackball.
c. A mouse occupies less space than a trackball.
d. A mouse is stationary, whereas a trackball has to be moved around.

ANSWER: b

39. Identify an input device used to grade multiple-choice and true/false tests.
a. Optical character reader (OCR)
b. Magnetic character sensor (MCS)
c. Magnetic ink character recognition (MICR) system
d. Optical mark recognition (OMR) system

ANSWER: d

40. A(n) _____ is a common output device for soft copy.
a. liquid crystal display
b. floppy disk
c. laser printer
d. electrostatic plotter

ANSWER: a

41. Which of the following statements is true of inkjet printers?
a. An inkjet printer uses multicolored ink cartridges to print digital photographs.
b. An inkjet printer's output is called a soft copy.

c. An inkjet printer uses laser-based technology that creates electrical charges on a rotating drum to attract toner.

d. An inkjet printer is used in large office environments with high-volume and high-quality printing requirements.

ANSWER: a

42. Identify a true statement about laser printers.

a. Laser printers use toners to create high-quality output.

b. Laser printers are used to generate three dimensional output.

c. Laser printers use plotters to create high-quality output.

d. Laser printers use solid ink to generate two dimensional output.

ANSWER: a

43. _____, which is nonvolatile, holds data when the computer is off or during the course of a program's operation, and it is also used to store large volumes of data for long periods.

a. Random access memory

b. Read-only memory

c. Secondary memory

d. Programmable read-only memory

ANSWER: c

44. The Clipboard's contents are typically stored in _____.

a. read-only memory (ROM)

b. random access memory (RAM)

c. magnetic disks

d. magnetic tapes

ANSWER: b

45. How is read-only memory (ROM) different from random access memory (RAM)?

a. ROM is volatile memory, whereas RAM is nonvolatile memory.

b. ROM is a secondary memory, whereas RAM is a primary memory.

c. ROM is nonvolatile memory, whereas RAM is volatile memory.

d. ROM is a read-write memory, whereas RAM is read only memory.

ANSWER: c

46. Which of the following memory devices allows data to be read and written?

a. magnetic storage

b. optical storage

c. random access memory (RAM)

d. read-only memory (ROM)

ANSWER: c

47. Identify a true statement about memory devices.

a. The contents of flash memory cannot be reprogrammed.
b. The contents of random access memory cannot be reprogrammed.
c. The contents of programmable read-only memory cannot be reprogrammed.
d. The contents of cache random access memory cannot be reprogrammed.

ANSWER: c

48. Which of the following is true about magnetic tapes?

a. It is made of metal.
b. It stores data sequentially.
c. It resembles a compact disc.
d. It is a main memory device.

ANSWER: b

49. A write once, read many (WORM) disc is a common type of _____.

a. magnetic storage
b. optical storage
c. random access memory (RAM)
d. read-only memory (ROM)

ANSWER: b

50. CD-ROMs and DVDs are examples of _____.

a. magnetic tapes
b. magnetic disks
c. optical discs
d. main memory devices

ANSWER: c

51. A _____ allows data to be stored in multiple places to improve a system's reliability.

a. remote access server
b. network-attached storage
c. random access memory
d. redundant array of independent disks

ANSWER: d

52. _____ storage, which is used for online storage and backup, involves multiple virtual servers that are usually hosted by third parties.

a. Kernel
b. Buffer
c. Cache
d. Cloud

ANSWER: d

53. Identify the computer that has the highest storage capability.

a. Subnotebooks
b. Notebooks
c. Personal computers
d. Supercomputers

ANSWER: d

54. An employee prints a document from his computer through a printer placed in a different location of the same network. Which of the following allows the employee to connect to network resources?

a. Remote access servers
b. Web servers
c. Application servers
d. Disk servers

ANSWER: a

55. Which of the following is the OS for most PCs and belongs to the system software group?

a. Microsoft Windows
b. Microsoft Excel
c. Microsoft Access
d. Microsoft Publisher

ANSWER: a

56. Which of the following best defines an operating system?

a. It is a set of programs for controlling and managing computer hardware and software.
b. It is a computer and all the software for managing network resources and offering services to a network.
c. It is a collection of disk drives used for fault tolerance, typically in large network systems.
d. It is the main circuit board containing connectors for attaching additional boards.

ANSWER: a

57. Identify a true statement about the supervisor program.

a. It controls all the programs in the OS to perform special tasks.
b. It prioritizes tasks performed by the CPU.
c. It transfers data among other parts of a computer system.
d. It generates checksum programs to verify that data is not corrupted.

ANSWER: a

58. The control programs managing computer hardware and software perform the _____ function to control and prioritize tasks performed by the CPU.

a. application management
b. resource management
c. data management
d. job management

ANSWER: d

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59. The supervisor program in an operating system (OS) is called the _____.

a. kernel
b. metadata
c. applet
d. cache

ANSWER: a

60. UNIX is a type of _____.

a. storage area network
b. application software
c. remote access server
d. operating system

ANSWER: d

61. _____ software is used for drafting and has replaced traditional tools, such as T-squares, triangles, paper, and pencils.

a. Graphics
b. Project management
c. Computer-aided design
d. Presentation

ANSWER: c

62. _____ computer languages are machine independent and are called high-level languages.

a. First-generation
b. Second-generation
c. Third-generation
d. Fourth-generation

ANSWER: c

63. Java and C++ are _____ languages.

a. assembly
b. high-level
c. machine
d. compiler

ANSWER: b

64. Identify a computer language that is machine dependent.

a. High-level language
b. Assembly language
c. Extensible markup language
d. Structure query language

ANSWER: b

65. Which of the following computer languages use mnemonics to represent data?

a. Assembly language
b. First-generation language
c. Fourth-generation language
d. Machine language

ANSWER: a

66. A source code must be first translated into _____ code.
A. binary
B. object
C. machine
D. assembly

ANSWER: object

67. The _____ is the heart of a computer.
A. main memory
B. Basic Input/Output System (BIOS)
C. central processing unit (CPU)
D. serial port

ANSWER: central processing unit (CPU)

68. A _____ is an input device for computers.
A. mouse
B. printer
C. monitor
D. speaker

ANSWER: Mouse

69. The _____ tells the computer what to do, such as instructing the computer which device to read or send output to.
A. main memory
B. motherboard
C. operating system
D. control unit

ANSWER: control unit

70. A(n) _____ is the enclosure containing a computer's main components.
A. disk drive
B. computer chassis
C. expansion slot
D. parallel port

ANSWER: computer chassis

71. _____ computers include parallel processing, gallium arsenide chips that run at higher speeds and consume less power than silicon chips and optical technologies.

A. Second-generation
B. Third-generation
C. Fourth-generation
D. Fifth-generation

ANSWER: Fifth-generation

72. _____ bits equal 1 byte.
A. Six
B. Eight
C. Twenty four
D. Thirty two

ANSWER: Eight

73. The most common type of main memory is a semiconductor memory chip made of _____.
A. arsenic
B. germanium
C. silicon
D. manganese

ANSWER: silicon

74. A _____, made of Mylar, is used for random-access processing of data in a computer.
A. magnetic tape
B. hard disk
C. cassette tape
D. magnetic disk

ANSWER: magnetic disk

75. A(n) _____, a memory device, uses laser beams to access and store data.
A. magnetic tape
B. memory chip
C. optical disc
D. digital card

ANSWER: Optical disc

76. _____ are compatible with the IBM System/360 line introduced in 1965.
A. Minicomputers
B. Mainframe computers
C. Personal computers
D. Super computers

ANSWER: Mainframe computers

77. _____ store computer software, which users can access from their workstations.

A. Database servers
B. Web servers
C. Application servers
D. File servers

ANSWER: Application servers

78. Microsoft PowerPoint is the most commonly used _____ software.
A. desktop publishing
B. presentation
C. graphics
D. project management

Feedback: Microsoft PowerPoint is the most commonly used presentation software; other examples include Adobe Persuasion and Corel Presentations. See 2-7b: Application Software.
ANSWER: presentation

79. Corel Quattro Pro is an example of _____ software.
A. word-processing
B. spreadsheet
C. database
D. desktop publishing

Feedback: Common spreadsheet software includes Microsoft Excel, IBM's Lotus 1-2-3, and Corel Quattro Pro. See 2-7b: Application Software.
ANSWER: spreadsheet

80. Codes written for one type of computer using _____ language do not work on another type of computer.
A. assembly
B. structured query
C. fourth-generation
D. fifth-generation

Feedback: Assembly language, the second generation of computer languages, is a higher-level language than machine language, but is also machine dependent. See 2-8: Computer Languages.
ANSWER: assembly

81. Provide a general description of how to write a computer program.
ANSWER: To write a computer program, first a user must know what needs to be done, and then he or she must plan a method to achieve this goal, including selecting the right language for the task. Many computer languages are available; the language the user selects depends on the problem being solved and the type of computer he or she is using.

82. What is a bus on a network?
ANSWER: A bus is a link between devices connected to the computer. It can be parallel or serial, internal (local) or external.

83. Write a short note on single processor and multiprocessor systems.
ANSWER: Some computers have a single processor; other computers, called multiprocessors, contain multiple

processors. Multiprocessing is the use of two or more CPUs in a single computer system. Generally, a multiprocessor computer has better performance than a single-processor computer in the same way that a team would have better performance than an individual on a large, time-consuming project.

84. What is a motherboard?

ANSWER: A motherboard is the main circuit board containing connectors for attaching additional boards. In addition, it usually contains the CPU, Basic Input/Output System (BIOS), memory, storage, interfaces, serial and parallel ports, expansion slots, and all the controllers for standard peripheral devices, such as the display monitor, disk drive, and keyboard.

85. Describe how computer speed is measured.

ANSWER: Typically, computer speed is measured as the number of instructions performed during the following fractions of a second:
a. Millisecond: 1/1,000 of a second
b. Microsecond: 1/1,000,000 of a second
c. Nanosecond: 1/1,000,000,000 of a second
d. Picosecond: 1/1,000,000,000,000 of a second

86. Describe a binary system in computers.

ANSWER: Every character, number, or symbol on the keyboard is represented as a binary number in computer memory. A binary system consists of 0s and 1s, with a 1 representing "on" and a 0 representing "off," similar to a light switch.

87. Describe touch screen.

ANSWER: Touch screen, which usually works with menus, is a combination of input devices. Some touch screens rely on light detection to determine which menu item has been selected, and others are pressure sensitive. Touch screens are often easier to use than keyboards, but they might not be as accurate because selections can be misread.

88. What are the most common output devices for soft copy?

ANSWER: The most common output devices for soft copy are cathode ray tube (CRT), plasma display, and liquid crystal display (LCD).

89. What are the three main types of secondary memory devices?

ANSWER: There are three main types of secondary memory devices: magnetic disks, magnetic tape, and optical discs.

90. What is the reason for the popularity of memory sticks?

ANSWER: Memory sticks have become popular because of their small size, high storage capacity, and decreasing cost.

91. Explain how a redundant array of independent disks (RAID) provides fault tolerance and improves performance.

ANSWER: With RAID, data can be stored in multiple places to improve the system's reliability. In other words, if one disk in the array fails, data is not lost. In some RAID configurations, sequences of data can be read from multiple disks simultaneously, which improves performance.

92. What are fax servers?

ANSWER: Fax servers contain software and hardware components that enable users to send and receive faxes.

93. What are print servers?

ANSWER: Print servers enable users to send print jobs to network printers.

94. Describe desktop publishing software.

ANSWER: Desktop publishing software is used to produce professional-quality documents without expensive hardware and software. This software works on a "what-you-see-is-what-you-get" concept, so the high-quality screen display gives a user a good idea of what he or she will see in the printed output.

95. What is assembly language? Provide an example.

ANSWER: Assembly language is the second generation of computer languages. It is a higher-level language than machine language but is also machine dependent. It uses a series of short codes, or mnemonics, to represent data or instructions. For example, ADD and SUBTRACT are typical commands in assembly language. Writing programs in assembly language is easier than in machine language.

96. Describe the use of gallium arsenide as a replacement for silicon.

ANSWER: Because silicon cannot emit light and has speed limitations, computer designers have concentrated on technology using gallium arsenide, in which electrons move almost five times faster than in silicon. Devices made with this synthetic compound can emit light, withstand higher temperatures, and survive much higher doses of radiation than silicon devices. The major problems with gallium arsenide are difficulties in mass production. This material is softer and more fragile than silicon, so it breaks more easily during slicing and polishing. Because of the high costs and difficulty of production, the military is currently the major user of this technology. However, research continues to eliminate some shortcomings of this technology.

97. Discuss the three basic tasks performed by computers.

ANSWER: Computers can perform three basic tasks: arithmetic operations, logical operations, and storage and retrieval operations.

Computers can add, subtract, multiply, divide, and raise numbers to a power (exponentiation), as shown in these examples:
A + B (addition): 5 + 7 = 12
A - B (subtraction): 5 - 2 = 3
A * B (multiplication): 5 * 2 = 10
A / B (division): 5 / 2 = 2.5
A ^ B (exponentiation): 5 ^ 2 = 25

Computers can perform comparison operations by comparing two numbers. For example, a computer can compare x to y and determine which number is larger.
Computers can store massive amounts of data in very small spaces and locate a particular item quickly. For example, a person can store the text of more than one million books in a memory device about the size of his or her fist.

98. What is the most common type of main memory? Describe the purpose of cache RAM.

ANSWER: The most common type of main memory is a semiconductor memory chip made of silicon. A semiconductor memory device can be volatile or nonvolatile. Volatile memory is called random access memory (RAM), although you could think of it as "read-write memory." In other words, data can be read from and written to RAM. Some examples of the type of information stored in RAM include open files, the Clipboard's contents, running programs, and so forth.
A special type of RAM, called cache RAM, resides on the processor. Because memory access from main RAM storage generally takes several clock cycles (a few nanoseconds), cache RAM stores recently accessed memory so the processor is not waiting for the memory transfer.

99. Describe the data management function of an operating system.

ANSWER: The data management function of an operating system controls data integrity by generating checksums to verify that data has not been corrupted or changed. When the OS writes data to storage, it generates a value (the checksum) along with the data. The next time this data is retrieved, the checksum is recalculated and compared with the original checksum. If they match, the integrity is intact. If they do not, the data has been corrupted somehow.

100. Describe fifth-generation languages (5GLs) and some of their features.

ANSWER: Fifth-generation languages (5GLs) use some of the artificial intelligence technologies, such as knowledge-based systems, natural language processing (NLP), visual programming, and a graphical approach to programming. Codes are automatically generated and designed to make the computer solve a given problem without a programmer or with minimum programming effort. These languages are designed to facilitate natural conversations between a user and the computer. Imagine that the user could ask his or her computer, "What product generated the most sales last year?" The computer, equipped with a voice synthesizer, could respond, "Product X." Dragon NaturallySpeaking Solutions is an example of NLP. Research continues in this field because of the promising results so far.