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Chapter 2: Computers: The Machines Behind Computing

Student: _____

1. Computers have gone through drastic changes in a short time.

   True False

2. Computers are excellent at correcting incorrect data that is sent to programs.

   True False

3. Both the ALU and control unit are part of the BIOS.

   True False

4. A bus may be internal or external.

   True False

5. A serial port is a communication interface through which information is transferred one bit at a time.

   True False

6. Fourth-generation computers operated on integrated circuits (ICs), which enabled computers to be even smaller, faster, more reliable, and more sophisticated.

   True False

7. ENIAC is an example of a first-generation computer.

   True False

8. Unlike humans, computers don’t make mistakes.

   True False

9. A petabyte is 2^{30} bytes.

   True False

10. Computers and communication systems use data codes to represent and transfer data between computers and network systems.

    True False

11. Positioning with a trackball is sometimes less precise than with a mouse.

    True False

12. The United States Postal Service uses OMR to sort mail.

    True False

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

    True False

14. Main memory stores data and information and is usually nonvolatile.

    True False

15. Random access memory can be read from and written to.

    True False

16. A magnetic disk is a type of secondary memory.

    True False

17. Hard disks come in a variety of sizes and can be internal or external.

    True False

18. NAS is composed of arrays such that if one disk in the array fails, data is not lost.

    True False

19. NAS is popular for Web servers and e-mail servers because it lowers management costs and helps make these servers more fault tolerant.

    True False

20. A spreadsheet is a table of rows and columns, and spreadsheet software is capable of performing numerous tasks with the information in a spreadsheet.

    True False

21. The portion of the computer responsible for adding numbers is the ____.

    A. ALU
    B. control unit
    C. logic unit
    D. bus

22. A(n) ____ is a peripheral device for recording, storing, and retrieving information.

    A. bus
    B. disk drive
    C. ALU
    D. motherboard

23. The BIOS is part of the ____.

    A. CPU
    B. ALU
    C. motherboard
    D. bus

24. Transistors were the major technology for the ____ generation of hardware.

    A. first
    B. second
    C. third
    D. fourth

25. IBM System z10 is an example of a ____ generation computer.

    A. second
    B. third
    C. fourth
    D. fifth

26. High-level languages represent the ____ generation of computer languages.

    A. first
    B. second
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    D. fourth

27. Computer speed might be measured in ____ or 1/1,000,000,000,000 of a second.

    A. milliseconds
    B. microseconds
    C. nanoseconds
    D. picoseconds

28. ASCII defines up to ____ characters.

    A. 8
    B. 128
    C. 258
    D. 1024

29. The most widely used input device is the ____.

    A. keyboard
    B. mouse
    C. touch screen
    D. MICR

30. ____ is an example of a soft copy output.

    A. Liquid crystal display
    B. Inkjet
    C. Laser
    D. Voice

31. The Clipboard's contents are stored in ____.

    A. ROM
    B. RAM
    C. PROM
    D. EPROM

32. CD-ROMs and DVDs are examples of ____ disks.

A. magnetic
B. tape
C. optical
D. flash

33. ____ is a type of memory that must be accessed sequentially.

A. Magnetic disk
B. Magnetic tape
C. Optical disk
D. RAID

34. Which of the following has the highest storage capacity?

A. memory stick
B. hard disk
C. CD-ROM
D. DVD-ROM

35. Typically, ____ are used only in large enterprises because of their cost and installation complexity.

A. SANs
B. NASs
C. CD-ROMs
D. hard disks

36. ____ servers are configured to store and manage vast amounts of data for access from users' computers.

A. Application
B. Disk
C. Database
D. Web

37. The supervisor program of an OS is called the ____.

A. kernel
B. resource allocater
C. job manager
D. data manager

38. Microsoft Word is an example of ____ software.

A. spreadsheet
B. presentation
C. graphics
D. word processing

39. IBM Freelance is an example of ____ software.

A. spreadsheet
B. presentation
C. graphics
D. word processing

40. Java and C++ are ____ computer languages.

A. assembly
B. high-level
C. fourth generation
D. fifth generation

41. A(n) _____ is a peripheral device for recording, storing, and retrieving information

_____

42. A(n) _____ port is a communication interface through which information is transferred one bit at a time.

_____

43. In computers, data is stored in _____.

_____

44. A(n) _____ pen is easy to use, inexpensive, and accurate and is particularly useful for engineers and graphics designers because they work well on modifications to technical drawings.

_____

45. The most common type of main memory is semiconductor memory chips made of _____.

_____

46. _____ read-only memory is similar to PROM, but its contents can be erased and reprogrammed.

_____

47. _____ discs use laser beams to access and store data.

_____

48. A(n) _____ disk made of mylar or metal is used for random-access processing.

_____

49. A SAN offers only storage; a(n) _____ system offers both storage and file services.

_____

50. _____ computers are usually compatible with the IBM System/360 line introduced in 1965.

_____

51. _____ servers store Web pages for access over the Internet.

_____

52. The _____ function of an operating system manages computer resources, such as storage and memory.

_____

53. Microsoft PowerPoint is the most commonly used _____ software.

_____

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

_____

55. Imagine that you could ask your computer, “What product generated the most sales last year?” This is an example of _____ processing.

_____

56. What are some possible future effects of the everyday use of computers?

57. Provide a high-level description of how to write a computer program.

58. What is the difference between a single processor and multiprocessor system?

59. What is a motherboard?

60. Describe second-generation computers.

61. How is computer speed measured?

62. What is a binary system?

63. What are touch screens?

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

65. What are the main types of secondary memory?

66. Why are memory sticks popular?

67. What is a fax server?

68. What is a print server?

69. Describe desktop publishing software.

70. What is assembly language?

71. Provide a definition for a computer and explain the purpose of a computer program.

72. Describe the use of gallium arsenide as a replacement for silicone.

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

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

75. What are fifth-generation languages? Describe their features and provide examples of 5GLs.

Chapter 2: Computers: The Machines Behind Computing Key

1. Computers have gone through drastic changes in a short time.

   TRUE

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   FALSE

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   FALSE

4. A bus may be internal or external.

   TRUE

5. A serial port is a communication interface through which information is transferred one bit at a time.

   TRUE

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   FALSE

7. ENIAC is an example of a first-generation computer.

   TRUE

8. Unlike humans, computers don't make mistakes.

   TRUE

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   FALSE

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    TRUE

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43. In computers, data is stored in _____.

bits

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light

45. The most common type of main memory is semiconductor memory chips made of _____.

silicon

46. _____ read-only memory is similar to PROM, but its contents can be erased and reprogrammed.

Erasable programmable

47. _____ discs use laser beams to access and store data.

Optical

48. A(n) _____ disk made of mylar or metal is used for random-access processing.

magnetic

49. A SAN offers only storage; a(n) _____ system offers both storage and file services.

NAS *or*
network attached storage

50. _____ computers are usually compatible with the IBM System/360 line introduced in 1965.

Mainframe

51. _____ servers store Web pages for access over the Internet.

Web

52. The _____ function of an operating system manages computer resources, such as storage and memory.

resource allocation

53. Microsoft PowerPoint is the most commonly used _____ software.

presentation

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

Computer-aided design *or*
CAD

55. Imagine that you could ask your computer, “What product generated the most sales last year?” This is an example of _____ processing.

natural language

56. What are some possible future effects of the everyday use of computers?

Computers have become so ubiquitous, in fact, that a cashless and checkless society is likely just around the corner. Similarly, computers might eliminate the need for business travel.

57. Provide a high-level description of how to write a computer program.

To write a computer program, first you must know what needs to be done, and then you must plan a method to achieve this goal, including selecting the right language for the task. Many computer languages are available—the language you select depends on the problem being solved and the type of computer you’re using. Regardless of the language, a program is also referred to as the “source code.” This source code must be translated into object code—consisting of binary 0s and 1s.

58. What is the difference between a single processor and multiprocessor system?

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 would on a large, time-consuming project.

59. What is a motherboard?

A motherboardis 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.

60. Describe second-generation computers.

Second-generation computers used transistors and were faster, more reliable, and easier to program and maintain.

61. How is computer speed measured?

Typically, computer speed is measured as the number of instructions performed per the following fractions of a second:
• Millisecond: 1/1000 of a second
• Microsecond: 1/1,000,000 of a second
• Nanosecond: 1/1,000,000,000 of a second
• Picosecond: 1/1,000,000,000,000 of a second

62. What is a binary system?

A binary system consists of 0s and 1s, with a 1 representing “on” and a 0 representing “off,” similar to a light switch.

63. What are touch screens?

Touch screens, which usually work with menus, are actually 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. You probably saw touch screens used extensively during the 2008 presidential election to show electoral maps and analyze election data in different ways quickly.

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

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

65. What are the main types of secondary memory?

There are three main types: magnetic disks, magnetic tape, and optical discs.

66. Why are memory sticks popular?

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

67. What is a fax server?

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

68. What is a print server?

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

69. Describe desktop publishing software.

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” (WYSIWYG, pronounced “wizzy-wig”) concept, so the high-quality screen display gives you a good idea of what you’ll see in the printed output.

70. What is assembly language?

Assembly language, the second generation of computer languages, 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

71. Provide a definition for a computer and explain the purpose of a computer program.

A computeris defined as a machine that accepts data as input, processes data without human intervention by using stored instructions, and outputs information. The instructions, also called a “program,” are step-by-step directions for performing a specific task, written in a language the computer can understand. Remember that a computer only processes data (raw facts); it can’t change or correct the data that’s entered. If data is erroneous, the information the computer provides is also erroneous. This rule is sometimes called GIGO: garbage in, garbage out.

72. Describe the use of gallium arsenide as a replacement for silicone.

Because silicon can't 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.

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

The most common type of main memory is semiconductor memory chips 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 that the processor isn't waiting for the memory transfer.

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

This function controls data integrity by generating checksums to verify that data hasn't been corrupted or changed. Today's OSs use 256-bit checksums that guarantee integrity to almost 100 percent. Briefly, 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 don't, the data has been corrupted somehow. In addition, the OS can correct some corrupt data (but not all), back up data automatically to prevent data loss, and control access to data for improved security.

75. What are fifth-generation languages? Describe their features and provide examples of 5GLs.

Fifth-generation languages (5GLs) use some of the artificial intelligent technologies, such as knowledge-based systems, natural language processing (NLP), visual programming, and graphical approach to using programming. Codes are automatically generated and designed to make the computer solve a given problem without a programmer or with minimum programming efforts. These languages are designed to facilitate natural conversations between you and the computer. Imagine that you could ask your computer, "What product generated the most sales last year?" Your 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.Some of the programming languages used for Internet programming and Web development include ActiveX, C++, Java, JavaScript, Perl, Visual Basic, and Extensible Stylesheet Language (XSL). The most important Web development languages are Hypertext Markup Language (HTML) and Extensible Markup Language (XML). Both languages are markup languages, not full programming languages.