

1. True or False? Computer software is the collection of programs that provide the instructions that a computer carries out.
2. True or False? An abstraction is a mental model that removes or hides complex details.
3. True or False? The abacus was the world's first electronic digital computer.
4. True or False? Ada Augusta, Countess of Lovelace, is credited with being the first programmer.
5. True or False? A vacuum tube was a device used in the first generation of computers to link computers together into a network.
6. True or False? The transistor ushered in the second generation of commercial computers.
7. True or False? The fourth generation of computer hardware was characterized by large-scale integration.
8. True or False? Large-scale integration is the process of using multiple input devices on a single computer.
9. True or False? The personal computer was introduced in the fourth generation of computer hardware.
10. True or False? A computer that has a parallel architecture uses multiple central processing units (CPUs).
11. True or False? The Internet is descended from a U.S. government-sponsored network called the ARPANET.
12. True or False? An assembler translates assembly-language programs into machine code.
13. True or False? A systems programmer writes programs that make it easier for others to program.
14. True or False? A high-level language is more English-like than assembly language.
15. True or False? Spreadsheets and word processors are known as software applications.
16. True or False? The World Wide Web is as old as the Internet itself.
17. Which of the following terms best describes circuit boards, keyboards, and disk drives?
 - A. computing system
 - B. computer hardware
 - C. computer software
 - D. stored memory
 - E. native system tools
18. Which of the following terms best describes the concept of abstraction?
 - A. exposing difficulty
 - B. hiding quantity
 - C. exposing distance
 - D. hiding details
 - E. exposing representation

19. In which decade were the first generation of computers developed?

- A. 1930s
- B. 1940s
- C. 1950s
- D. 1960s
- E. 1970s

20. Charles Babbage invented which of the following early computing devices?

- A. analytical engine
- B. memory drum
- C. transistor
- D. vacuum tube
- E. abacus

21. Which of the following phrases best describes a Turing machine?

- A. a device for integrating many chips on one circuit board
- B. an abstract mathematical model of computing
- C. the first electronic digital computer
- D. the first successful memory storage device
- E. the first computer capable of network communication

22. Who built the first gear-driven mechanical machine that did addition and subtraction?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

23. Who built the first mechanical machine that did addition, subtraction, multiplication, and division?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

24. Who designed the first mechanical machine that included memory?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

25. Who was the first programmer?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

26. Who proposed that a punched card be used for counting the census?

- A. Leibniz
- B. Pascal
- C. Babbage
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27. What device replaced the vacuum tube?

- A. disk drive
- B. transistor
- C. magnetic drum
- D. terminal
- E. punch card

28. In which hardware generation were integrated circuits introduced?

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

29. What is the name of a solid piece of silicon that contains transistors, other components, and their connections?

- A. workstation
- B. server
- C. integrated circuit
- D. motherboard
- E. magnetic disk

30. Which language is built into the electrical circuitry of a computer?

- A. assembly language
- B. machine language
- C. compiled language
- D. high-level language
- E. interpreted language

31. In which software generation did the distinction between systems programmers and other programmers first surface?

- A. first
- B. second
- C. third
- D. fourth
- E. fifth

32. In which software generation were the FORTRAN and COBOL languages developed?

- A. first
- B. second
- C. third
- D. fourth
- E. fifth

33. Which of the following is an application package?

- A. FORTRAN
- B. assembly language
- C. C++
- D. object-oriented program
- E. word processor

34. Computer _____ is the collection of programs that provide the instructions that a computer carries out.

35. A(n) _____ is a mental model that removes complex details.

36. _____ has been considered an astronomical calendar, a temple, and a predictor of lunar eclipses.

37. The device that used cards with holes punched in them to dictate the design of woven cloth was known as _____.

38. The most prestigious award given in computer science is called the _____.
39. First generation computers were built using _____ to store information.
40. The set of instructions that each type of computer is designed to understand is called _____.
41. A computer with a parallel architecture uses multiple _____ to solve a problem.
42. In the earliest electronic computers, programmers had to write machine language code expressed as _____ digits.
43. FORTRAN and COBOL are two of the earliest _____ programming languages.
44. The computer's operating system and language translators are generally known as _____.
45. A British researcher at the CERN physics lab, Tim Berners-Lee, invented the _____.
46. What is computer software?
47. Describe the innermost layer of a computing system.
48. What is the focus of the application layer of a computer system?
49. Who was Ada Augusta, Countess of Lovelace?
50. What is a Turing machine?
51. Why did the invention of the transistor usher in a new generation of commercial computers?
52. What is Moore's law?
53. Name two of the earliest high-level languages.
54. What is a compiler?
55. What kinds of programs make up systems software?
56. Name two major events that mark the beginning of the fifth software generation.
57. Explain the onion analogy we use in this book to organize our exploration of computing systems.
58. In what way is driving a car an abstraction?
59. Give some examples of abstractions as they relate to a computer system.
60. Describe the separation between the user and the computer hardware as software evolved.
61. Distinguish between computing as a tool and computing as a discipline.

Chapter 1 Review Quiz - **ANSWERS**

1. True or False? Computer software is the collection of programs that provide the instructions that a computer carries out.

Answer: True

2. True or False? An abstraction is a mental model that removes or hides complex details.

Answer: True

3. True or False? The abacus was the world's first electronic digital computer.

Answer: False

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5. True or False? A vacuum tube was a device used in the first generation of computers to link computers together into a network.

Answer: False

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7. True or False? The fourth generation of computer hardware was characterized by large-scale integration.

Answer: True

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- B. computer hardware
- C. computer software
- D. stored memory
- E. native system tools

Answer: B

18. Which of the following terms best describes the concept of abstraction?

- A. exposing difficulty
- B. hiding quantity
- C. exposing distance
- D. hiding details
- E. exposing representation

Answer: D

19. In which decade were the first generation of computers developed?

- A. 1930s
- B. 1940s
- C. 1950s
- D. 1960s

E. 1970s

Answer: C

20. Charles Babbage invented which of the following early computing devices?

- A. analytical engine
- B. memory drum
- C. transistor
- D. vacuum tube
- E. abacus

Answer: A

21. Which of the following phrases best describes a Turing machine?

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- B. an abstract mathematical model of computing
- C. the first electronic digital computer
- D. the first successful memory storage device
- E. the first computer capable of network communication

Answer: B

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- A. Leibniz
- B. Pascal
- C. Babbage
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- E. Hollerith

Answer: B

23. Who built the first mechanical machine that did addition, subtraction, multiplication, and division?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

Answer: A

24. Who designed the first mechanical machine that included memory?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

Answer: C

25. Who was the first programmer?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

Answer: D

26. Who proposed that a punched card be used for counting the census?

- A. Leibniz
- B. Pascal
- C. Babbage
- D. Lovelace
- E. Hollerith

Answer: E

27. What device replaced the vacuum tube?

- A. disk drive
- B. transistor
- C. magnetic drum
- D. terminal
- E. punch card

Answer: B

28. In which hardware generation were integrated circuits introduced?

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

Answer: C

29. What is the name of a solid piece of silicon that contains transistors, other components, and their connections?

- A. workstation
- B. server
- C. integrated circuit
- D. motherboard
- E. magnetic disk

Answer: C

30. Which language is built into the electrical circuitry of a computer?

- A. assembly language
- B. machine language
- C. compiled language
- D. high-level language
- E. interpreted language

Answer: B

31. In which software generation did the distinction between systems programmers and other programmers first surface?

- A. first
- B. second
- C. third
- D. fourth
- E. fifth

Answer: A

32. In which software generation were the FORTRAN and COBOL languages developed?

- A. first
- B. second
- C. third
- D. fourth
- E. fifth

Answer: B

33. Which of the following is an application package?

- A. FORTRAN
- B. assembly language
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- E. word processor

Answer: E

34. Computer _____ is the collection of programs that provide the instructions that a computer carries out.

Answer: Software

35. A(n) _____ is a mental model that removes complex details.

Answer: Abstraction

36. _____ has been considered an astronomical calendar, a temple, and a predictor of lunar eclipses.

Answer: Stonehenge

37. The device that used cards with holes punched in them to dictate the design of woven cloth was known as _____.

Answer: Jacquard's loom

38. The most prestigious award given in computer science is called the _____.

Answer: Turing award

39. First generation computers were built using _____ to store information.

Answer: vacuum tubes

40. The set of instructions that each type of computer is designed to understand is called _____.

Answer: machine language

41. A computer with a parallel architecture uses multiple _____ to solve a problem.

Answer: central processing units

42. In the earliest electronic computers, programmers had to write machine language code expressed as _____ digits.

Answer: Binary

43. FORTRAN and COBOL are two of the earliest _____ programming languages.

Answer: high-level

44. The computer's operating system and language translators are generally known as _____.

Answer: systems software

45. A British researcher at the CERN physics lab, Tim Berners-Lee, invented the _____.

Answer: World Wide Web

46. What is computer software?

Answer: The collection of programs that provide the instructions that a computer executes.

47. Describe the innermost layer of a computing system.

Answer: The information layer of a computer system deals with the way we represent information, including numbers, text, images, audio, and video, on a computer.

48. What is the focus of the application layer of a computer system?

Answer: The application layer focuses on the programs that allow users to solve real-world problems.

49. Who was Ada Augusta, Countess of Lovelace?

Answer: Ada was a nineteenth century mathematician who worked with Charles Babbage and his Analytical Engine, and is considered to be the first computer programmer.

50. What is a Turing machine?

Answer: A Turing machine is an abstract mathematical model developed by Alan Turing that laid the foundation for theoretical computing.

51. Why did the invention of the transistor usher in a new generation of commercial computers?

Answer: The transistor replaced the vacuum tube as a core computer component, and was smaller, more reliable, faster, and cheaper.

52. What is Moore's law?

Answer: Moore's law states that computers will either double in power at the same price or halve in cost for the same power every 18 months.

53. Name two of the earliest high-level languages.

Answer: FORTRAN and COBOL (also Lisp)

54. What is a compiler?

Answer: A software tool that translates a program written in a high-level language into its equivalent machine code.

55. What kinds of programs make up systems software?

Answer: The operating system, its utility programs, and various language translators (assemblers and compilers).

56. Name two major events that mark the beginning of the fifth software generation.

Answer: Growing popularity of object-oriented design and programming and the development of the World Wide Web (also the rise of Microsoft).

57. Explain the onion analogy we use in this book to organize our exploration of computing systems.

Answer: A computing system is like an onion in that it is made up of layers, ranging from the information layer, which deals with how various types of information are represented on a computer, to the communication layer, which deals with the protocols used when computers communicate with each other. Just as you wouldn't bite through many layers of an onion in one step, it's best to explore a computing system one layer at a time, to see how each one contributes to the whole.

58. In what way is driving a car an abstraction?

Answer: To drive a car, you only need to understand and focus on a set of controls that make the car perform. These include the steering wheel, gas and brake pedals, and turning signals. The user need not understand the details of how a car operates, such as how the combustion engine drives the pistons, or how the transmission works. The driving controls provide a simplified interface to an otherwise complicated machine.

59. Give some examples of abstractions as they relate to a computer system.

Answer: A user might run an application program to solve a problem, and need only know how that program runs. The interface to the application program masks the underlying programming statements that make up the program. That program, written in a high-level language, is itself an abstraction, hiding the details of the machine-level instructions that actually get executed when the program runs.

60. Describe the separation between the user and the computer hardware as software evolved.

Answer: The separation between the user and the computer hardware has widened as software evolved. On early computers, the user had no options but to deal directly with the hardware in very precise, error prone ways. The abstractions provided by high-level languages and application programs decreased the need for the user to understand or interact with the low-level processing at the hardware level. This evolution has allowed everyone to become a computer user.

61. Distinguish between computing as a tool and computing as a discipline.

Answer: According to Peter Denning, computing as a discipline is the study of algorithmic processes that describe and transform information: their theory, analysis, design, efficiency, implementation, and application. Computing as a tool is the use of computers in any area except for creating tools.