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Chapter 02 - Introduction to Systems Architecture

1. Some commercial computers have used quantum physics to perform data storage and computation.
    a. True
    b. False
ANSWER: True
POINTS: 1
REFERENCES: 24

2. The Difference Engine computed logarithms by moving gears and other mechanical components.
    a. True
    b. False
ANSWER: True
POINTS: 1
REFERENCES: 22

3. Mechanical computers such as the Mark One were used during World War I to compute trajectory tables for naval guns and torpedoes.
    a. True
    b. False
ANSWER: False
POINTS: 1
REFERENCES: 22

4. Mechanical computation devices cannot perform complex calculations.
    a. True
    b. False
ANSWER: False
POINTS: 1
REFERENCES: 22

5. A machine capable of adding whole numbers can multiply whole numbers by executing the addition function multiple times.
    a. True
    b. False
ANSWER: True
POINTS: 1
REFERENCES: 22

6. The biggest impetus for the change to electronic computing devices came during World War I.
    a. True
    b. False
ANSWER: False
POINTS: 1
REFERENCES: 23

7. Electronic computers addressed most shortcomings of mechanical computation.
    a. True

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b. False

ANSWER: True
POINTS: 1
REFERENCES: 23

8. Light can be used as a basis for computation.
a. True
b. False

ANSWER: True
POINTS: 1
REFERENCES: 23

9. Optics have little advantage over electronics in most areas of computing technology.
a. True
b. False

ANSWER: False
POINTS: 1
REFERENCES: 24

10. Optical processors might be easier to fabricate than current processors and are better matched to optical communication technologies.
a. True
b. False

ANSWER: True
POINTS: 1
REFERENCES: 24

11. In classical physics, a subatomic particle, such as a photon, can be in multiple places at one time.
a. True
b. False

ANSWER: False
POINTS: 1
REFERENCES: 24

12. All computers are automated computing devices, and all automated computing devices are computers.
a. True
b. False

ANSWER: False
POINTS: 1
REFERENCES: 26

13. A typical computer system must have much more secondary storage capacity than primary storage capacity.
a. True
b. False

ANSWER: True

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POINTS: 1
REFERENCES: 33

14. A tablet computer is a laptop computer that emphasizes small size, reduced weight, low cost, and wireless networking and is capable of performing only light-duty tasks, such as Web browsing, e-mailing, and word processing.
    a. True
    b. False
ANSWER: False
POINTS: 1
REFERENCES: 35

15. Server hardware capabilities depend on the resources being shared and the number of simultaneous users.
    a. True
    b. False
ANSWER: True
POINTS: 1
REFERENCES: 37

16. The World Wide Web is sometimes called a network of networks because it interconnects millions of other networks.
    a. True
    b. False
ANSWER: False
POINTS: 1
REFERENCES: 45

17. A URL identifies one specific WWW resource.
    a. True
    b. False
ANSWER: True
POINTS: 1
REFERENCES: 46

18. The primary role of software is to translate users' needs and requests into CPU instructions that, when executed, produce a result that satisfies the need or request.
    a. True
    b. False
ANSWER: True
POINTS: 1
REFERENCES: 47

19. The need or idea that motivates a request for computer processing is stated at a specific level.
    a. True
    b. False
ANSWER: False
POINTS: 1
REFERENCES: 47

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20. Windows OSs tend toward an all-inclusive approach to system software, bundling most system software functions in the OS.

a. True
b. False

ANSWER: True
POINTS: 1
REFERENCES: 48

21. An end-user accesses a Web-based application via a URL.

a. True
b. False

ANSWER: True
POINTS: 1
REFERENCES: 49

22. The evolution of Microsoft OSs is a good example of how software development depends on hardware technology.

a. True
b. False

ANSWER: True
POINTS: 1
REFERENCES: 54

23. The 80386 provided hardware support for running multiple programs simultaneously, simplified partitioning primary storage among programs, and provided mechanisms for preventing programs from interfering with one another.

a. True
b. False

ANSWER: True
POINTS: 1
REFERENCES: 54

24. A simple definition of a computer is a device that can accept numeric inputs, perform computational functions, and ____.

a. communicate results
b. solve formulas
c. store data on disk or flash RAM
d. detect quantum storage states

ANSWER: a
POINTS: 1
REFERENCES: 21

25. Early mechanical computation devices were built to perform ____.

a. text processing
b. mathematical simulation
c. repetitive mathematical calculations
d. repetitive text operations

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ANSWER: c
POINTS: 1
REFERENCES: 22

26. Optical computation harnesses the energy of moving ____ to perform computational work.
    a. muons
    b. photons
    c. electrons
    d. positrons
ANSWER: b
POINTS: 1
REFERENCES: 23

27. A particle of light is called a ____.
    a. muon
    b. photon
    c. quantum
    d. meson
ANSWER: b
POINTS: 1
REFERENCES: 23

28. Optical light pulses can be stored indirectly, such as ____.
    a. on the surface of a DVD
    b. on the surface of a magnetic disk
    c. in the blocks of flash memory
    d. the groves of a record
ANSWER: a
POINTS: 1
REFERENCES: 23

29. ____ signals can carry more data than electrical signals.
    a. Mechanical
    b. Digital
    c. Optical
    d. Quantum
ANSWER: c
POINTS: 1
REFERENCES: 24

30. ____ physics describes the behavior of matter at a subatomic level.
    a. Einsteinian
    b. Newtonian
    c. Relativity
    d. Quantum

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ANSWER: d
POINTS: 1
REFERENCES: 24

31. Quantum physics describes subatomic behavior with ____.
    a. physical rules
    b. mathematical rules
    c. physical laws
    d. a combination of physical rules and mathematical laws

ANSWER: b
POINTS: 1
REFERENCES: 24

32. In a modern digital computer, data is represented by groups of ____.
    a. qubits
    b. photons
    c. bits
    d. waves

ANSWER: c
POINTS: 1
REFERENCES: 24

33. Any matter that stores data in multiple simultaneous quantum states is called a ____.
    a. qubit
    b. bit
    c. Limit
    d. quantum

ANSWER: a
POINTS: 1
REFERENCES: 25

34. In classical physics, a group of 3 bits can store only one of ____ possible values at a time.
    a. 6
    b. 8
    c. 12
    d. 24

ANSWER: b
POINTS: 1
REFERENCES: 25

35. The first commercially available quantum computer was built by ____.
    a. IBM
    b. Sony
    c. D-Wave
    d. Hewlett-Packard

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ANSWER: c
POINTS: 1
REFERENCES: 25

36. A(n) ____ is a program in which different sets of instructions are applied to different data input values.
    a. system
    b. problem
    c. solution
    d. algorithm

ANSWER: d
POINTS: 1
REFERENCES: 27

37. The CPU contains a few internal storage locations called ____, each capable of holding a single instruction or data item.
    a. the ALU
    b. registers
    c. shifters
    d. the compiler

ANSWER: b
POINTS: 1
REFERENCES: 31

38. Storage devices that hold currently executing programs are called ____
    a. primary storage
    b. registers
    c. qubits
    d. secondary storage

ANSWER: a
POINTS: 1
REFERENCES: 32

39. Storage devices that hold data not needed by currently running programs are called ____
    a. primary storage
    b. registers
    c. qubits
    d. secondary storage

ANSWER: d
POINTS: 1
REFERENCES: 33

40. In current computer hardware, main memory is implemented with silicon-based semiconductor devices commonly called ____.
    a. Flash
    b. PROM

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c. ROM
d. RAM

ANSWER: d
POINTS: 1
REFERENCES: 32

41. A ____ is a computer system designed to meet a single user's information-processing needs.
a. personal computer
b. mainframe
c. supercomputer
d. minicomputer

ANSWER: a
POINTS: 1
REFERENCES: 34

42. A ____ is designed for one purpose—computational speed with large problems.
a. supercomputer
b. mainframe
c. microcomputer
d. server

ANSWER: a
POINTS: 1
REFERENCES: 38

43. The term ____ can describe computers as small as midrange computers and as large as supercomputers.
a. mainframe
b. client
c. server
d. grid

ANSWER: c
POINTS: 1
REFERENCES: 38

44. A ____ is a group of similar or identical computers, connected by a high-speed network, that cooperate to provide services or run a single application.
a. cloud
b. cluster
c. blade
d. grid

ANSWER: b
POINTS: 1
REFERENCES: 41

45. A ____ is a circuit board that contains most of a server.
a. grid

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b. cloud
c. cluster
d. blade

ANSWER: d
POINTS: 1
REFERENCES: 41

46. ____ are typically implemented by installing software on each machine that accepts tasks from a central server and performs them when not busy doing other work.
a. Grids
b. Clouds
c. Clusters
d. Blades

ANSWER: a
POINTS: 1
REFERENCES: 41

47. A ____ is a set of computing resources with front-end interfaces and back-end resources.
a. grid
b. cluster
c. cloud
d. blade

ANSWER: c
POINTS: 1
REFERENCES: 42

48. ____ is typically the cheapest component of current information systems.
a. System software
b. Hardware
c. Middleware
d. Application software

ANSWER: b
POINTS: 1
REFERENCES: 44

49. "____" is the concept that the per-unit cost of producing goods or providing services decreases as the organization size increases.
a. Economies of scale
b. Economies of measure
c. Economies of balance
d. Economies of growth

ANSWER: a
POINTS: 1
REFERENCES: 45

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50. A ____ consists of hardware, software, and transmission media that enable computer systems to share information, software, and hardware resources.

a. computer system
b. computer network
c. computer environment
d. computer platform

ANSWER: b
POINTS: 1
REFERENCES: 45

51. The complexity of modern networks arises from the huge quantity of ____.

a. centralized resources
b. local resources
c. distributed resources
d. cloud services

ANSWER: c
POINTS: 1
REFERENCES: 45

52. A specific shared resources within the World Wide Web is identified by a(n) ____.

a. URL
b. ALU
c. CPU
d. WWW

ANSWER: a
POINTS: 1
REFERENCES: 46

53. A(n) ____ is a stored set of instructions for responding to a specific request, much as you might look up a recipe to prepare a particular dish.

a. operating system
b. computer system
c. compiler
d. application program

ANSWER: d
POINTS: 1
REFERENCES: 48

54. ____ is targeted to general-purpose tasks that support many application programs and users.

a. Application software
b. System software
c. Niche software
d. Commodity software

ANSWER: b
POINTS: 1

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REFERENCES: 48

55. Most application software is used by ____.
    a. end users
    b. programmers
    c. engineers
    d. administrators

ANSWER: a
POINTS: 1
REFERENCES: 48

56. In the "layered approach," knowledge of the machine's physical details is embedded into system software and hidden from users and application programmers. This is commonly referred to as ____.
    a. machine dependence
    b. virtualization
    c. machine independence
    d. abstraction

ANSWER: c
POINTS: 1
REFERENCES: 49

57. The ____ software layer has utility programs used by end users and system administrators to manage and control computer resources.
    a. system services
    b. machine independent
    c. machine dependent
    d. system management

ANSWER: d
POINTS: 1
REFERENCES: 47

58. ____ software describes programs used to develop other programs.
    a. Application development
    b. Application design
    c. Systems
    d. Application modeling

ANSWER: a
POINTS: 1
REFERENCES: 49

59. A ____ is a program that translates instructions in a programming language into CPU instructions.
    a. compiler
    b. linker
    c. program translator
    d. parser

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ANSWER: c
POINTS: 1
REFERENCES: 49

60. The ____ chip provided integrated memory caches, enhanced computational capabilities, and increased raw CPU speed. Windows 95 was developed to take better advantage of this chip's capabilities.

a. 8088
b. 80286
c. 80386
d. 80486

ANSWER: d
POINTS: 1
REFERENCES: 54

61. ____ improved memory access and raw CPU speeds and added features such as support for higher-speed system buses, pipelined instruction execution, and multimedia processing instructions.

a. Pentium processors
b. Multiple-core CPUs
c. 80x86 processors
d. PowerPC processors

ANSWER: a
POINTS: 1
REFERENCES: 54

62. A simple definition of a(n) _____ is any device that can accept numeric inputs, perform computational functions, such as addition and subtraction, and communicate results.
ANSWER: computer
POINTS: 1
REFERENCES: 21

63. The most famous of the mechanical computation devices is the _____, built by Charles Babbage in 1821.
ANSWER: Difference Engine
POINTS: 1
REFERENCES: 22

64. In a(n) _____ device, the movement of electrons performs essentially the same functions as gears and wheels in mechanical computers.
ANSWER: electronic computing
POINTS: 1
REFERENCES: 22

65. A moving photon's _____ can be harnessed to perform computational work.
ANSWER: energy
POINTS: 1
REFERENCES: 23

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66. _____ data communication is common in computer networks that cover large distances.
ANSWER: Optical
POINTS: 1
REFERENCES: 24

67. For computer components such as processors, _____ are expected to gradually supplant electronics during the 21st Century.
ANSWER: Optics
POINTS: 1
REFERENCES: 24

68. Current computer technology is based on principles of _____ physics developed during the 17th through 20th centuries, including electronics, magnetism, and optics.
ANSWER: classical
POINTS: 1
REFERENCES: 24

69. A(n) _____ is a device that performs data manipulation and transformation functions including computation, comparison, and data movement.
ANSWER: processor
POINTS: 1
REFERENCES: 26

70. A(n) _____ is a stored set of instructions for performing a specific task.
ANSWER: program
POINTS: 1
REFERENCES: 26

71. In contrast to a formula, a program that implements an algorithm must include comparison and _____ instructions.
ANSWER: branching
POINTS: 1
REFERENCES: 28

72. The _____ is a general-purpose processor that executes all instructions and controls all data movement in the computer system.
ANSWER: central processing unit CPU
POINTS: 1
REFERENCES: 30

73. A(n) _____ is a computer or group of computers that manages shared resources and enables users and other computer to access those resources over a network.
ANSWER: server
POINTS: 1
REFERENCES: 37

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74. _____ offers flexibility in server configuration and deployment, including the ability to "resize" virtual machines easily to match changing requirements.
ANSWER: Virtualization
POINTS: 1
REFERENCES: 39

75. A(n) _____ configuration is any arrangement of multiple computers used to support specific services or applications.
ANSWER: multicomputer
POINTS: 1
REFERENCES: 40

76. A(n) _____ is a group of dissimilar computers, connected by a high-speed network, that cooperate to provide services or run a shared application.
ANSWER: grid
POINTS: 1
REFERENCES: 41

77. _____ typically make use of both multicomputer configuration and virtualization.
ANSWER: Clouds
POINTS: 1
REFERENCES: 42

78. _____'s law is the mathematical formula that describes belief that the large and powerful computers will always be more cost effective than smaller ones.
ANSWER: Grosch
POINTS: 1
REFERENCES: 44

79. The phrase _____ is the concept that the per-unit cost of producing goods or services decreases as the size of the producing or delivering organization increases..
ANSWER: economies of scale
POINTS: 1
REFERENCES: 45

80. A(n) _____ identifies a specific web resources.
ANSWER: URL
POINTS: 1
REFERENCES: 46

81. _____ is layered between applications software and computer hardware.
ANSWER: system software
POINTS: 1
REFERENCES: 48

82. A(n) _____ is application software that is accessed via a URL and uses a Web browser as the primary user interface

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ANSWER: Web-based application
POINTS: 1
REFERENCES: 49

83. A(n) _____ is software accessed over the Internet using Web protocols, such as shipping cost calculator accessed by an online shopping application.
ANSWER: Web server
POINTS: 1
REFERENCES: 50

84. A(n) _____ is a collection of utility programs that supports users and application programs, allocates resources, and controls access to hardware.
ANSWER: operating system
POINTS: 1
REFERENCES: 53

85. A key function of _____ software is allocating resources to users and programs.
ANSWER: system
POINTS: 1
REFERENCES: 54

86. List two limitations in mechanical computation.
ANSWER: Complex design and construction

Wear, breakdown, and maintenance of mechanical parts

Limits on operating speed

POINTS: 1
REFERENCES: 22

87. Why is the computational capacity/speed of quantum computers much higher than conventional computers for certain types of tasks? Should all computers be quantum computers?
ANSWER: The qubit enables the computer to store and process multiple data items at the same time. As a result, many computations can be performed on many related data items simultaneously, yielding much greater parallelism and performance than conventional computers.

All computer don't need to be quantum computers because not all computational problems benefit from the additional power of quantum computing. Also, quantum computers are currently much more expensive than conventional computers. As long as the cost difference remains, quantum computing applied only to problems where its cost-effective.
POINTS: 1
REFERENCES: 25

88. Is the term server a computer hardware classification, a mode of computer use, or both?
ANSWER: It's primarily a mode of use – managing shared resources and enabling access to them by users and other computer systems. But that mode of use typically implies many simultaneous accesses. The hardware capability required to support many accesses implies larger and more powerful computer systems including midrange, mainframe, and supercomputers.

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POINTS: 1
REFERENCES: 37

89. Discuss the influence of Pentium processors on technology development.
ANSWER: Pentium processors improved memory access and raw CPU speeds and added features such as support for higher-speed system buses, pipelined instruction execution, and multimedia processing instructions. Microsoft OS development split into two distinct paths. The first path started with Windows 95, which evolved into Windows 98 and finally Windows Me. Multimedia instructions served as a foundation for improved high-resolution graphics and audio and video. The second path was a new family of OSs that began with Windows NT and continued through Windows 2000 and XP. Increased CPU speed and improved memory management enabled Microsoft to embed more sophisticated memory and hardware management capabilities in Windows NT than in other Windows OSs. These improvements also allowed Microsoft to develop server OSs, including Windows 2000 Server and Windows Server 2003.
POINTS: 1
REFERENCES: 54

90. The ____ software layer has utility programs used by system management and application programs to perform common functions
a. system management
b. system services
c. machine independent
d. machine dependent
ANSWER: b
POINTS: 1

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