

## **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 grooves 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