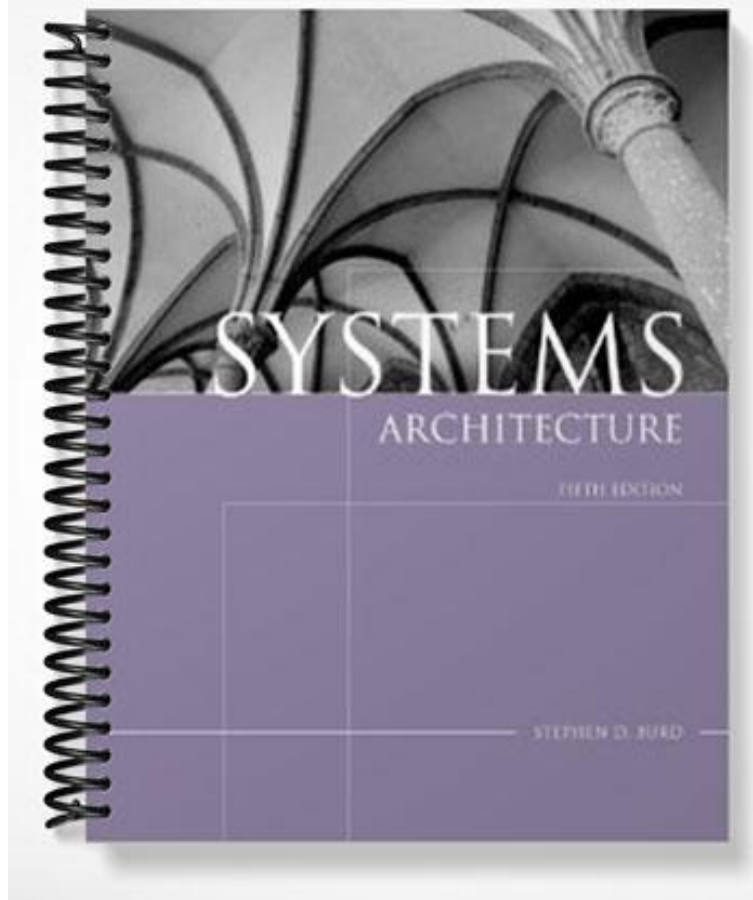


TEST BANK



ch02

True/False

Indicate whether the statement is true or false.

- ___ 1. The Babbage difference engine is an example of an optical computing device.
- ___ 2. A program is a stored set of instructions that implements a specific task, such as calculating payroll and then generating paychecks or electronic fund transfers.
- ___ 3. A special-purpose processor is capable of executing many different instructions in many different sequences or combinations.
- ___ 4. Comparison instructions are used to solve algorithmic but not formulaic problems.
- ___ 5. The control unit is the 'plumbing' that connects all computer system components.
- ___ 6. The primary components of a CPU are the control unit, arithmetic logic unit, and primary storage.
- ___ 7. Registers are a component of a CPU.
- ___ 8. The ALU retrieves input data directly from primary storage.
- ___ 9. The contents of registers can be accessed by the CPU more quickly than the contents of primary storage.
- ___ 10. Primary storage is a component of a CPU.
- ___ 11. Programs not currently being executed are held in primary storage.
- ___ 12. Data inputs to the currently executing instruction are held in registers.
- ___ 13. Comparison instructions are executed by the control unit.
- ___ 14. Data movement instructions are executed by the control unit.
- ___ 15. The CPU always determines the next instruction to fetch by adding one to the address of the previously fetched instructions.
- ___ 16. Most of a currently executing program's data is held in registers.
- ___ 17. Primary storage devices can't be used to implement secondary storage because their capacity is too small.
- ___ 18. Most primary storage devices can't be used to implement secondary storage because they're volatile.
- ___ 19. Most of a currently executing program's instructions are held in registers.
- ___ 20. According to the text, the computer class with the smallest computational capacity is the microcomputer.
- ___ 21. The most important difference between a network computer and other workstations is a lack of locally stored application and/or system software.
- ___ 22. A mainframe generally supports more simultaneous users than a midrange computer.
- ___ 23. The computer class with the greatest I/O capacity is the mainframe.
- ___ 24. A microcomputer cannot be used as a server.
- ___ 25. The computer class with the greatest computational capacity is the mainframe.
- ___ 26. A workstation is generally implemented with the latest and most expensive cutting-edge technology.
- ___ 27. A cluster contains multiple computer systems housed in a single cabinet.

- ___ 28. A cluster is a group of similar or identical computers, connected by a high speed network, that cooperate to provide services or execute a common application.
- ___ 29. System software is specialized to a specific user need.

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

- ___ 30. The term systems architecture describes the structure, interaction, and technology of computer system components. _____
- ___ 31. Quantum physics describes the behavior of matter at the subatomic level. _____
- ___ 32. An atom, or any other matter that stores data in multiple simultaneous quantum states, is called a(n) quantum byte. _____
- ___ 33. A(n) instruction is a signal or command to a processor to perform one of its functions. _____
- ___ 34. A(n) general-purpose processor is, in essence, a processor with a single internal program. _____
- ___ 35. Most useful computational tasks, such as recalculating a spreadsheet, are accomplished by executing a long sequence of instructions called a(n) program. _____
- ___ 36. The control unit is the 'plumbing' that connects all computer system components. _____
- ___ 37. The input/output unit is a general-purpose processor that executes all instructions and controls all data movement within the computer system. _____
- ___ 38. The ALU retrieves input data directly from primary storage. _____
- ___ 39. A powerful CPU needs a high-capacity I/O unit to keep it supplied with instructions and data from primary storage. _____
- ___ 40. Programs not currently being executed are held in primary storage. _____
- ___ 41. Data inputs to the currently executing instruction are held in registers. _____
- ___ 42. Most of a currently executing program's instructions are held in registers. _____
- ___ 43. Most of a currently executing program's data is held in registers. _____
- ___ 44. A(n) network computer is a microcomputer with minimal secondary storage capacity and little or no installed software. _____
- ___ 45. The computer class with the smallest computational capacity is the microcomputer. _____
- ___ 46. A(n) supercomputer generally supports more simultaneous users than a midrange computer. _____
- ___ 47. The computer class with the greatest I/O capacity is the mainframe. _____
- ___ 48. A(n) supercomputer is generally implemented with the latest and most expensive cutting-edge technology. _____
- ___ 49. The computer class with the greatest computational capacity is the mainframe. _____

- ___ 50. A grid is a group of similar or identical computers, connected by a high speed network, that cooperate to provide services or execute a common application. _____
- ___ 51. Application software is specialized to a specific user need. _____
- ___ 52. A(n) application program is a collection of utility programs that supports users and application programs, allocates computer resources among multiple users and application programs, and controls access to computer hardware. _____
- ___ 53. Debugging tools are used to simulate program execution and enable programmers to trace errors. _____
- ___ 54. A(n) computer network is a set of hardware and software components that enables multiple users and computer systems to share information, software, and hardware resources. _____

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ___ 55. Which of the following terms describes the structure, interaction, and technology of computer system components?
- | | |
|---------------------|-------------------------|
| a. Computer network | c. Operating system |
| b. System software | d. Systems architecture |
- ___ 56. The Babbage difference engine is an example of what type of computing device?
- | | |
|---------------|------------|
| a. Mechanical | c. Optical |
| b. Electrical | d. Quantum |
- ___ 57. Which of the following statements about optical devices is not true?
- Optical devices are at the leading edge of computer hardware technology.
 - Optical devices are gradually replacing electrical and magnetic storage devices.
 - Some input/output devices are based on optical technologies and devices.
 - Optical data communication is still not common in computer networks that cover relatively large distances.
- ___ 58. For which of the following computing problem types have experimental quantum computers already been developed?
- | | |
|---------------------------|-----------------|
| a. Simulation | c. Cryptography |
| b. Transaction Processing | d. Data Mining |
- ___ 59. A(n) _____ is a device that performs data manipulation and transformation functions.
- | | |
|----------------|---------------------|
| a. instruction | c. algorithm |
| b. processor | d. operating system |
- ___ 60. Most useful computational tasks, such as recalculating a spreadsheet, are accomplished by executing a long sequence of instructions called a(n) _____.
- | | |
|----------------|--------------|
| a. instruction | c. algorithm |
| b. program | d. processor |
- ___ 61. A(n) _____ is a program in which different sets of instructions are applied to different data input values.
- | | |
|---------------|----------------------------|
| a. I/O device | c. processor |
| b. algorithm | d. central processing unit |
- ___ 62. Comparison instructions are part of a group of _____, implying a relationship to intelligent, decision-making behavior.
- | | |
|-------------------|-------------------------|
| a. conditions | c. application programs |
| b. logic programs | d. logic instructions |
- ___ 63. Which of the following is not one of the major functions of computer hardware?

- a. processing
 - b. storage
 - c. external communication
 - d. data manipulation
- ___ 64. What is the purpose of the I/O units within a computer system?
- a. To execute instructions.
 - b. To hold programs not currently being executed.
 - c. To implement external communication functions.
 - d. To connect all other communication devices.
- ___ 65. The primary components of a CPU are ____.
- a. control unit, primary storage, and secondary storage
 - b. control unit, arithmetic logic unit, and primary storage
 - c. primary storage, secondary storage, and bus
 - d. control unit, arithmetic logic unit, and registers
- ___ 66. Which of the following is a general-purpose processor that executes all instructions and controls all data movement within the computer system?
- a. Operating system
 - b. I/O unit
 - c. CPU
 - d. Primary storage
- ___ 67. Which of the following contains electrical circuits that implement instructions?
- a. Control unit
 - b. ALU
 - c. Register
 - d. Primary storage
- ___ 68. Which of the following stores data or instructions that are needed immediately or frequently?
- a. Registers
 - b. ALU
 - c. Control unit
 - d. Secondary storage
- ___ 69. Which of the following is not one of the components of the central processing unit?
- a. control unit
 - b. ALU
 - c. system bus
 - d. registers
- ___ 70. Which of the following is not a component of a central processing unit?
- a. arithmetic logic unit
 - b. registers
 - c. primary storage
 - d. control unit
- ___ 71. Where are data inputs to the currently executing instruction held?
- a. control unit
 - b. registers
 - c. primary storage
 - d. secondary storage
- ___ 72. From where does the ALU retrieve its input data?
- a. registers
 - b. primary storage
 - c. main memory
 - d. secondary storage
- ___ 73. Which storage device can be accessed most quickly by the CPU?
- a. primary storage
 - b. secondary storage
 - c. main memory
 - d. registers
- ___ 74. Which of the following is not an instruction type executed by the ALU?
- a. addition
 - b. division
 - c. comparison
 - d. data movement
- ___ 75. Primary storage is also referred to as ____.
- a. register
 - b. ROM
 - c. main memory
 - d. I/O
- ___ 76. ___ provides the access speed required by the CPU and allows the CPU to read or write to specific memory locations.
- a. ROM
 - b. Secondary storage
 - c. RAM
 - d. ALU
- ___ 77. What component is the 'plumbing' that connects all computer system components?

- a. control unit
b. system bus
- c. CPU
d. arithmetic logic unit
- ___ 78. Why can't primary storage be used for the same purposes as secondary storage?
a. It is volatile
b. It is non-volatile
c. It is too fast
d. It is too expensive
- ___ 79. Where is most or all of a currently executing program's data held?
a. control unit
b. registers
c. primary storage
d. secondary storage
- ___ 80. Where is most or all of a currently executing program's instructions held?
a. control unit
b. registers
c. primary storage
d. secondary storage
- ___ 81. Where are programs not currently being executed held?
a. control unit
b. registers
c. primary storage
d. secondary storage
- ___ 82. Why aren't secondary storage devices generally used to implement primary storage?
a. they're too expensive
b. their capacity is too small
c. they're volatile
d. they're too slow
- ___ 83. Which class of computer has the lowest computational capacity?
a. microcomputer
b. midrange computer
c. mainframe
d. supercomputer
- ___ 84. A(n) ___ is a microcomputer with minimal secondary storage capacity and little or no installed software.
a. supercomputer
b. mainframe
c. network computer
d. midrange computer
- ___ 85. Which of the following is the most important difference between a network computer (NC) and other microcomputers (MC)?
a. NC is able to access files on a server
b. NC lacks permanently stored software
c. NC has more limited primary storage capacity
d. NC has more limited CPU capabilities
- ___ 86. Which class of computer has the greatest I/O capacity?
a. microcomputer
b. midrange computer
c. mainframe
d. supercomputer
- ___ 87. Which of the following describes a computer system that manages one or more shared resources such as file systems or databases, and allows users to access these resources over a local- or wide-area network?
a. Servers
b. Network computer
c. Personal computer
d. Workstation
- ___ 88. Which computer class is generally implemented with the latest and most expensive cutting-edge technology?
a. workstation
b. midrange computer
c. mainframe
d. supercomputer
- ___ 89. Which class of computer has the highest computational capacity?
a. microcomputer
b. midrange computer
c. mainframe
d. supercomputer
- ___ 90. Which of the following multicomputer configurations doesn't require specialized hardware?
a. blade
b. cluster computer
c. grid
d. network computer
- ___ 91. The computer scientist ___ asserted that computing power, as measured by millions of instructions per second (MIPS), is proportional to the square of the cost of hardware.
a. Moore
c. Rock

Completion

Complete each statement.

105. A(n) _____ is a program in which different sets of instructions are applied to different data input values.
106. Comparison instructions are part of a group of _____, implying a relationship to intelligent, decision-making behavior.
107. _____ instructions are used to solve algorithmic but not formulaic problems.
108. The _____ is a general-purpose processor that executes all instructions and controls all data movement within the computer system.
109. Data inputs to the currently executing instruction are held in _____.
110. The contents of _____ can be accessed by the CPU more quickly than the contents of primary storage.
111. Most of a currently executing program's instructions are held in _____.
112. The _____ is the 'plumbing' that connects all computer system components.
113. _____ may also be called main memory and is generally implemented using random access memory (RAM).
114. Programs not currently being executed are held in _____.
115. Most of a currently executing program's data is held in _____.
116. A(n) _____ is a microcomputer with minimal secondary storage capacity and little or no installed software.
117. The computer class with the smallest computational capacity is the _____.
118. The computer class with the greatest I/O capacity is the _____.
119. A(n) _____ is a computer that manages shared resources and allows access to them through a network.
120. A(n) _____ class computer can be used as a server.
121. The computer class with the greatest computational capacity is the _____.
122. _____ software is specialized to a specific user need.
123. A(n) _____ is a collection of utility programs that supports users and application programs, allocates computer resources among multiple users and application programs, and controls access to computer hardware.
124. _____ tools simulate program execution and enable programmers to trace errors.

Short Answer

125. What is/are the difference(s) between a formulaic and algorithmic problem?
126. What are the advantage(s) of network computers as compared to 'ordinary' microcomputers for organizations with large numbers of desktop computers?

127. How does a network computer differ from an 'ordinary' microcomputer?
128. How does a supercomputer differ from a mainframe?
129. What characteristics differentiate a mainframe computer from a supercomputer?
130. Why can't computer system classes such as "midrange computer" and "supercomputer" be defined in terms of facts and figures such as processor speed, primary storage capacity, and disk storage capacity?
131. What is the difference between an application program and a systems program?

Essay

132. Grosch's Law states that computer hardware power, as measured by the number of instructions a processor can execute in a fixed time interval, increases in proportion to the square of hardware cost. Is the law true and valid at present? Why or why not?
133. Which is generally "ahead" in terms of technological development - computer hardware or software?

ch02
Answer Section

TRUE/FALSE

- | | | | |
|-----|--------|--------|---------|
| 1. | ANS: F | PTS: 1 | REF: 22 |
| 2. | ANS: T | PTS: 1 | REF: 27 |
| 3. | ANS: F | PTS: 1 | REF: 27 |
| 4. | ANS: T | PTS: 1 | REF: 29 |
| 5. | ANS: F | PTS: 1 | REF: 32 |
| 6. | ANS: F | PTS: 1 | REF: 32 |
| 7. | ANS: T | PTS: 1 | REF: 33 |
| 8. | ANS: F | PTS: 1 | REF: 33 |
| 9. | ANS: T | PTS: 1 | REF: 33 |
| 10. | ANS: F | PTS: 1 | REF: 34 |
| 11. | ANS: F | PTS: 1 | REF: 34 |
| 12. | ANS: T | PTS: 1 | REF: 33 |
| 13. | ANS: F | PTS: 1 | REF: 34 |
| 14. | ANS: T | PTS: 1 | REF: 33 |
| 15. | ANS: F | PTS: 1 | REF: 34 |
| 16. | ANS: F | PTS: 1 | REF: 34 |
| 17. | ANS: F | PTS: 1 | REF: 34 |
| 18. | ANS: T | PTS: 1 | REF: 34 |
| 19. | ANS: F | PTS: 1 | REF: 34 |
| 20. | ANS: T | PTS: 1 | REF: 36 |
| 21. | ANS: T | PTS: 1 | REF: 36 |
| 22. | ANS: T | PTS: 1 | REF: 37 |
| 23. | ANS: T | PTS: 1 | REF: 38 |
| 24. | ANS: F | PTS: 1 | REF: 37 |
| 25. | ANS: F | PTS: 1 | REF: 37 |
| 26. | ANS: F | PTS: 1 | REF: 37 |
| 27. | ANS: F | PTS: 1 | REF: 40 |
| 28. | ANS: T | PTS: 1 | REF: 40 |
| 29. | ANS: F | PTS: 1 | REF: 45 |

MODIFIED TRUE/FALSE

- | | | | |
|-----|-----------------------------------|---------|---------|
| 30. | ANS: T | PTS: 1 | REF: 22 |
| 31. | ANS: T | PTS: 1 | REF: 25 |
| 32. | ANS: F, qubit | | |
| | PTS: 1 | REF: 25 | |
| 33. | ANS: T | PTS: 1 | REF: 27 |
| 34. | ANS: F, special-purpose processor | | |

- | | | | | |
|-----|---------------------------|---------|--------|---------|
| | PTS: 1 | REF: 27 | | |
| 35. | ANS: T | | PTS: 1 | REF: 27 |
| 36. | ANS: F, system bus | | | |
| | PTS: 1 | REF: 32 | | |
| 37. | ANS: F | | | |
| | central processing unit | | | |
| | CPU | | | |
| | PTS: 1 | REF: 32 | | |
| 38. | ANS: F, registers | | | |
| | PTS: 1 | REF: 33 | | |
| 39. | ANS: F, system bus | | | |
| | PTS: 1 | REF: 34 | | |
| 40. | ANS: F, secondary storage | | | |
| | PTS: 1 | REF: 34 | | |
| 41. | ANS: T | | PTS: 1 | REF: 33 |
| 42. | ANS: F, primary storage | | | |
| | PTS: 1 | REF: 34 | | |
| 43. | ANS: T | | PTS: 1 | REF: 35 |
| 44. | ANS: T | | PTS: 1 | REF: 36 |
| 45. | ANS: T | | PTS: 1 | REF: 36 |
| 46. | ANS: F, mainframe | | | |
| | PTS: 1 | REF: 37 | | |
| 47. | ANS: T | | PTS: 1 | REF: 37 |
| 48. | ANS: T | | PTS: 1 | REF: 37 |
| 49. | ANS: F, supercomputer | | | |
| | PTS: 1 | REF: 37 | | |
| 50. | ANS: F, cluster | | | |
| | PTS: 1 | REF: 40 | | |
| 51. | ANS: T | | PTS: 1 | REF: 45 |
| 52. | ANS: F, operating system | | | |
| | PTS: 1 | REF: 48 | | |
| 53. | ANS: T | | PTS: 1 | REF: 50 |
| 54. | ANS: T | | PTS: 1 | REF: 55 |

MULTIPLE CHOICE

- | | | | |
|-----|--------|--------|---------|
| 55. | ANS: D | PTS: 1 | REF: 22 |
| 56. | ANS: A | PTS: 1 | REF: 22 |

57.	ANS: D	PTS: 1	REF: 24
58.	ANS: C	PTS: 1	REF: 26
59.	ANS: B	PTS: 1	REF: 27
60.	ANS: B	PTS: 1	REF: 27
61.	ANS: B	PTS: 1	REF: 28
62.	ANS: D	PTS: 1	REF: 29
63.	ANS: D	PTS: 1	REF: 31
64.	ANS: C	PTS: 1	REF: 32
65.	ANS: D	PTS: 1	REF: 32
66.	ANS: C	PTS: 1	REF: 32
67.	ANS: B	PTS: 1	REF: 33
68.	ANS: A	PTS: 1	REF: 33
69.	ANS: C	PTS: 1	REF: 33
70.	ANS: C	PTS: 1	REF: 33
71.	ANS: B	PTS: 1	REF: 33
72.	ANS: A	PTS: 1	REF: 33
73.	ANS: D	PTS: 1	REF: 33
74.	ANS: D	PTS: 1	REF: 34
75.	ANS: C	PTS: 1	REF: 34
76.	ANS: C	PTS: 1	REF: 34
77.	ANS: B	PTS: 1	REF: 34
78.	ANS: A	PTS: 1	REF: 34
79.	ANS: C	PTS: 1	REF: 34
80.	ANS: C	PTS: 1	REF: 34
81.	ANS: D	PTS: 1	REF: 34
82.	ANS: D	PTS: 1	REF: 35
83.	ANS: A	PTS: 1	REF: 36
84.	ANS: C	PTS: 1	REF: 36
85.	ANS: B	PTS: 1	REF: 36
86.	ANS: C	PTS: 1	REF: 37
87.	ANS: A	PTS: 1	REF: 37
88.	ANS: D	PTS: 1	REF: 37
89.	ANS: D	PTS: 1	REF: 37
90.	ANS: C	PTS: 1	REF: 40
91.	ANS: B	PTS: 1	REF: 41
92.	ANS: D	PTS: 1	REF: 46
93.	ANS: A	PTS: 1	REF: 45
94.	ANS: A	PTS: 1	REF: 47
95.	ANS: D	PTS: 1	REF: 48
96.	ANS: A	PTS: 1	REF: 49
97.	ANS: A	PTS: 1	REF: 50
98.	ANS: A	PTS: 1	REF: 50
99.	ANS: B	PTS: 1	REF: 49
100.	ANS: C	PTS: 1	REF: 49
101.	ANS: B	PTS: 1	REF: 50
102.	ANS: D	PTS: 1	REF: 54
103.	ANS: B	PTS: 1	REF: 55

104. ANS: D PTS: 1 REF: 57

COMPLETION

105. ANS: algorithm

PTS: 1 REF: 28

106. ANS: logic instructions

PTS: 1 REF: 29

107. ANS:
Comparison
Branching

PTS: 1 REF: 29

108. ANS:
central processing unit
CPU

PTS: 1 REF: 32

109. ANS: registers

PTS: 1 REF: 33

110. ANS:
registers
a register

PTS: 1 REF: 33

111. ANS:
memory
main memory
RAM
random access memory
primary storage

PTS: 1 REF: 34

112. ANS:
bus
system bus

PTS: 1 REF: 34

113. ANS: Primary storage

PTS: 1 REF: 34

114. ANS: secondary storage

PTS: 1 REF: 35

115. ANS:
memory

main memory
RAM
random access memory
primary storage

PTS: 1 REF: 35

116. ANS: network computer

PTS: 1 REF: 36

117. ANS:
microcomputer
personal computer
PC

PTS: 1 REF: 36

118. ANS: mainframe

PTS: 1 REF: 37

119. ANS: server

PTS: 1 REF: 37

120. ANS:
microcomputer
personal computer
PC
midrange computer
mainframe
supercomputer

PTS: 1 REF: 38

121. ANS: supercomputer

PTS: 1 REF: 37

122. ANS:
Application
Applications

PTS: 1 REF: 45

123. ANS: operating system

PTS: 1 REF: 47

124. ANS: Debugging

PTS: 1 REF: 49

SHORT ANSWER

125. ANS:

With a formula, the same series of processing steps are applied to all data inputs, regardless of their value. For example, the formula for converting Fahrenheit temperature to Celsius temperature is the same regardless of the input Fahrenheit temperature. A processor that implements a formula uses only computation and data movement instructions.

With an algorithm, processing steps vary depending on the value(s) of data input(s). For example, an algorithm that implements a progressive income tax computation applies different tax rates to different levels of income. A processor that implements an algorithm uses computation, data movement, comparison, and branching instructions.

PTS: 1 REF: 28

126. ANS:

They are easier to administer and configure because they obtain all their software and configuration information from a server. They are also slightly cheaper.

PTS: 1 REF: 36

127. ANS:

It contains little or no secondary storage and does not permanently store system or application software.

PTS: 1 REF: 36

128. ANS:

A supercomputer supports high-speed computation - other capabilities are significant only to the extent they support computation. A supercomputer typically has no interactive users.

A mainframe supports hundreds to thousands of simultaneous interactive users or network access to shared resources. To fill this role a mainframe is optimized for input/output and secondary storage access - other capabilities are significant only to the extent they support I/O and secondary storage access.

PTS: 1 REF: 37

129. ANS:

Cost, I/O capacity, computational capacity, and number of simultaneous users. A supercomputer has higher cost and higher computational capacity. A mainframe has higher I/O capacity and can support a larger number of simultaneous users.

PTS: 1 REF: 37

130. ANS:

Computer technology and user needs and expectations change rapidly. The “specifications” of today’s mainframe become those of tomorrow’s midrange computer and those of a personal computer several years hence. Due to rapid improvements in computer specifications, and computer class definition based only on facts and figures soon becomes outdated.

PTS: 1 REF: 37-38

131. ANS:

An application program is customized to the needs of a specific user or organization. A systems program is general-purpose.

PTS: 1 REF: 44

ESSAY

132. ANS:

Grosch's Law may be true of processors in isolation but it isn't true of computer systems in general. Today, cost per unit of processor power increases with computer class. That is, as measured in terms of processor instruction execution speed, "bang for the buck" decreases as you move from microcomputer, to midrange computer, to mainframe, and ultimately to supercomputer.

The reasons that Grosch's Law no longer include the existence of distinct computer classes with vastly different production economies of scale and the relevance of things other than processor speed to computer system power. Smaller computers are manufactured in larger quantities and are thus more economical. Larger computers, particularly mainframes, provide important capabilities other than raw processor speed such as high-speed I/O and large secondary storage capacities.

PTS: 1

REF: 41

133. ANS:

There is a push-pull relationship between hardware and software, though hardware usually leads. Hardware designers add new features and capabilities in response to or in anticipation of needs that will be expressed in software. Software may be constructed in anticipation of future hardware capabilities or new hardware capabilities may be developed in anticipation of future software needs. In terms of the things end users see in working information systems, hardware usually leads the way because it takes time for software developers to write programs that take advantage of the latest hardware advances.

PTS: 1

REF: 54