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| 1. Java and C++ are examples of pseudocode languages.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 2. Input and output enable the computing agent to communicate with the outside world.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |  |  | |

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| 3. The if/then/else operation allows you to select exactly one of three alternatives.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 4. Having an infinite loop in an algorithm is an error.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 5. Once an algorithm has been developed, it may itself be used in the construction of other algorithms.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 6. Pseudocode is a formal language with rigidly standardized syntactic rules and regulations. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 7. \_\_\_\_ is an example of a natural language.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | C | b. | Java | |  | c. | English | d. | Perl |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 8. In the line of code, “Set the value of Area to length\*width”, “Area” is a \_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | value | b. | variable | |  | c. | constant | d. | primitive |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |

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| 9. A(n) \_\_\_\_ is a named storage location that can hold a data value.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | expression | b. | variable | |  | c. | computation | d. | constant |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |

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| 10. \_\_\_\_ operations provide the computing agent with data values from the outside world that it may then use in later instructions.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Ingoing | b. | Outgoing | |  | c. | Input | d. | Output |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 11. \_\_\_\_ operations send results from the computing agent to the outside world.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Input | b. | Put | |  | c. | Send | d. | Output |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 12. Together, conditional and iterative operations are called \_\_\_\_ operations.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | sequential | b. | control | |  | c. | hierarchical | d. | dynamic |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |

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| 13. \_\_\_\_ statements are the “question-asking” operations of an algorithm.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Primitive | b. | Iterative | |  | c. | Sequential | d. | Conditional |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 14. A \_\_\_\_ is the repetition of a block of instructions.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | cycle | b. | nucleus | |  | c. | matrix | d. | loop |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 15. An algorithm can fall into an infinite loop when \_\_\_\_.   |  |  |  | | --- | --- | --- | |  | a. | the input operations are missing | |  | b. | the algorithm uses more than one loop | |  | c. | the output operations are missing | |  | d. | the continuation condition of the loop never becomes false |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 16. “Print the value of *product*” is an example of a(n) \_\_\_\_ operation.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | sequential | b. | conditional | |  | c. | input | d. | output |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 17. A(n) \_\_\_\_ is a collection of useful, prewritten algorithms.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | primitive | b. | binary | |  | c. | set | d. | library |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 18. In order to implement a “find” functionality in a word processor, one would have to design a \_\_\_\_ algorithm.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | pattern matching | b. | natural language | |  | c. | sequential | d. | do-while |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | |

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| 19. Briefly describe what pseudocode is and is not.   |  |  | | --- | --- | | *ANSWER:* | Pseudocode is not a precise set of notational rules to be memorized and rigidly followed. It is a flexible notation that can be adjusted to fit your own view about how best to express ideas and algorithms. | | *POINTS:* | 5 | |  |  | |  |  | |

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| 20. Briefly define the concept of iteration   |  |  | | --- | --- | | *ANSWER:* | The powerful algorithmic concept of iteration means that instead of writing instruction 10,000 separate times, it is far better to write it only once and indicate that it is to be repetitively executed 10,000 times, or however many times it takes to obtain the answer. | | *POINTS:* | 5 | |

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| 21. Information is stored in the memory of a computer using the decimal numbering system.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |  |  | |
| 22. Explain what an arithmetic overflow is and what its significance in computer science is.   |  |  | | --- | --- | | *ANSWER:* | Arithmetic overflow occurs when there is an attempt to represent an integer that exceeds the maximum allowable value. No matter how many bits are ultimately used, there is always a maximum value beyond which the computer cannot correctly represent any integer. This characteristic is one of the major differences between the disciplines of mathematics and computer science. In mathematics, a quantity may usually take on any value, no matter how large. Computer science must deal with a finite—and sometimes quite limited—set of possible representations, and it must handle the errors that occur when those limits are exceeded. | | *POINTS:* | 5 | |  |  | |  |  | |
| 23. In a direct access storage device, every unit of information has a unique \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   |  |  | | --- | --- | | *ANSWER:* | address | | *POINTS:* | 2 | |  |  | |

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| 24. The acronym \_\_\_\_ is frequently used to refer to the memory unit of a computer.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | ROM | b. | CD | |  | c. | MDR | d. | RAM |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |  |  | |
| 25. Machine language is a high-level programming language.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |  |  | |

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| 26. C++ and Java are examples of \_\_\_\_ languages.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | low-level programming | b. | high-level programming | |  | c. | machine | d. | assembly |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |  |  | |
| 27. A(n) \_\_\_\_ operation involves the comparison of values and the subsequent use of the outcome to decide what to do next.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | iterative | b. | conditional | |  | c. | sequential | d. | transformer |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |  |  | |
| 28. What is the single most important piece of system software on the computer? Discuss its function, and discuss at length its software packages that handle the requests of other programs.   |  |  | | --- | --- | | *ANSWER:* | The program that controls the overall operation of the computer is the operating system, and it is the single most important piece of system software on a computer. It is the operating system that communicates with users, determines what they want, and activates other system programs, applications packages, or user programs to carry out their requests. The software packages that handle these requests include the following:  • User interface—All modern operating systems provide a powerful graphical user interface (GUI) that gives the user an intuitive visual overview as well as graphical control of the capabilities and services of the computer. • Language services—These programs, called assemblers, compilers, and interpreters, allow you to write programs in a high-level, user-oriented language rather than machine language and to execute these programs easily and efficiently. They often include components such as text editors and debuggers. • Memory managers—These programs allocate memory space for programs and data and retrieve this memory space when it is no longer needed. • Information managers—These programs handle the organization, storage, and retrieval of information on mass storage devices such as hard drives, CDs, DVDs, flash drives, and tapes. They allow you to organize your information in an efficient hierarchical manner, using directories, folders, and files. • I/O systems—These software packages allow you to easily and efficiently use the many different types of input and output devices that exist on a modern computer system. • Scheduler—This system program keeps a list of programs ready to run on the processor, and it selects the one that will execute next. The scheduler allows you to have a number of different programs active at a single time, for instance, surfing the Web while you are waiting for a file to finish printing. • Utilities—These collections of library routines provide a wide range of useful services either to a user or to other system routines. Text editors, online help routines, image and sound applications, and control panels are examples of utility routines. Sometimes these utilities are organized into collections called program libraries. | | *POINTS:* | 5 | |  |  | |  |  | |
| 29. A LAN connects devices that are not in close proximity but rather are across town, across the country, or across the ocean. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   |  |  | | --- | --- | | *ANSWER:* | False - WAN, wide area network, WAN (wide area network), wide area network (WAN) | | *POINTS:* | 2 | |
| 30. \_\_\_\_ is a low-power wireless standard used to communicate between devices located quite close to each other.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Bluetooth | b. | Wi-Fi | |  | c. | Bluenote | d. | Redtooth |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | |  |  | |
| 31. A \_\_\_\_ connects hardware devices such as computers, printers, and storage devices that are all in close proximity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | metro area network | b. | local area network | |  | c. | wide area network | d. | proximity network |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |  |  | |
| 32. In assembly language, the programmer need not manage the details of the movement of data items within memory.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |  |  | |
| 33. Machine language can use the notation --, //, or # to denote a program comment.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |  |  | |

34. List four disadvantages of assembly language.

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| *ANSWER:* | • The programmer must “manually” manage the movement of data items between and among memory locations and registers (although such data items can be assigned mnemonic names). • The programmer must take a microscopic view of a task, breaking it down into tiny subtasks at the level of what is going on in individual memory locations. • An assembly language program is machine specific. • Statements are not natural-language-like (although operations are given mnemonic code words as an improvement over a string of bits). |
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| 35. List four expectations of a program written in a high-level language.   |  |  | | --- | --- | | *ANSWER:* | • The programmer need not manage the details of the movement of data items within memory or pay any attention to exactly where those items are stored. • The programmer can take a macroscopic view of tasks, thinking at a higher level of problem solving (add B and C, and call the result A). The “primitive operations” used as building blocks in algorithm construction can be larger. • Programs are portable rather than machine specific. • Programming statements are closer to natural language and use standard mathematical notation. | | *POINTS:* | 5 | |  |  | |  |  | |
| 36. Writing all computer programs in the same programming language would be more efficient because all languages meet essentially the same needs.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |   Explain your answer   |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 5 | |  |  | |
| 37. C++ is in fact a “subset” of C, meaning that all of the C++ language is part of C.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |   Explain your answer   |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 5 | |  |  | |
| 38. All musicians are naturally opposed to music file sharing.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |  |  | |
| 39. A(n) \_\_\_\_ is someone who breaks into computer systems, launches Internet worms and viruses, or perpetrates other dubious computer-related vandalism.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Encryption | b. | PGP | |  | c. | Utilitarian | d. | hacker |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |  |  | |
| 40. Define cyberbullying.   |  |  | | --- | --- | | *ANSWER:* | Cyberbullying is humiliating, taunting, threatening, or invading someone’s privacy using the Internet, Web, or other type of electronic technology. Cyberbullying can take many forms, from posting hurtful and insulting messages, to leaking sensitive and embarrassing personal data, to online threats of violence and physical assault. | | *POINTS:* | 5 | |  |  | |  |  | |
| 41. \_\_\_\_ is the branch of computer science that explores techniques for incorporating aspects of intelligence into computer systems.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Internet technology | b. | Neural networks | |  | c. | Database technology | d. | Artificial intelligence |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |  |  | |

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| 42. The philosopher \_\_\_\_ was known to say “never treat a fellow human merely as a means to an end.”   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Descartes | b. | Turing | |  | c. | Aristotle | d. | Kant |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |  |  | |

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| 43. Respond to the observation that computer science is the study of how to write computer programs. Include an example to illustrate your argument.   |  |  | | --- | --- | | *ANSWER:* | Many people are introduced to computer science when learning to write programs in a language such as C++, Python, or Java. This almost universal use of programming as the entry to the discipline can create the misunderstanding that computer science is equivalent to computer programming.  Programming is extremely important to the discipline—researchers use it to study new ideas and build and test new solutions—but like the computer itself, it is a tool. When computer scientists design and analyze a new approach to solving a problem or create new ways to represent information, they often implement their ideas as programs to test them on an actual computer system. This enables researchers to see how well these new ideas work and whether they perform better than previous methods.  For example, searching a list is one of the most common applications of computers, and it is frequently applied to huge problems, such as finding one name among the approximately 20,000,000 listings in the New York City telephone directory. A more efficient lookup method could significantly reduce the time that customers must wait for directory assistance. Assume that we have designed what we believe to be a “new and improved” search technique. After analyzing it theoretically, we would study it empirically by writing a program to implement our new method, executing it on our computer, and measuring its performance. These tests would demonstrate under what conditions our new method is or is not faster than the directory search procedures currently in use.  In computer science, it is not simply the construction of a quality program that is important but also the methods it embodies, the services it provides, and the results it produces. It is possible to become so enmeshed in writing code and getting it to run that we forget that a program is only a means to an end, not an end in itself. | | *POINTS:* | 9 | |  |  | |  |  | |
| 44. List at least six of the recent developments in computer systems and the significance of these developments.   |  |  | | --- | --- | | *ANSWER:* | Some of the recent developments in computer systems include the following: • Massively parallel processors capable of quadrillions of computations per second • Smartphones, tablets, and other types of handheld digital devices • High-resolution graphics for imaging, animation, movie making, video games, and virtual reality • Powerful multimedia user interfaces incorporating sound, voice recognition, touch, photography, video, and television • Integrated digital devices incorporating data, television, telephone, camera, the Internet, the World Wide Web and, struggling for relevancy, the fax • Wireless communications • Massive storage devices capable of holding 100 petabytes of data • Ubiquitous computing, in which miniature computers are embedded into our cars, cameras, kitchen appliances, home heating systems, clothing, and even our bodies | | *POINTS:* | 9 | |  |  | |  |  | |