TRUE/FALSE

1. No matter which programming language a computer programmer uses, the language has rules governing its word usage and punctuation.

   ANS: T PTS: 1 REF: 2

2. A program that is free of syntax errors will produce the correct results.

   ANS: F PTS: 1 REF: 3

3. External storage is needed to run a program but it is volatile.

   ANS: F PTS: 1 REF: 5

4. Computer programmers often refer to memory addresses using hexadecimal notation.

   ANS: T PTS: 1 REF: 5

5. The programmer's job can be broken down into five development steps.

   ANS: F PTS: 1 REF: 6

6. Variable names may not begin with a digit, although usually they may contain digits.

   ANS: T PTS: 1 REF: 17

7. A magic number is a named constant whose meaning is not immediately apparent.

   ANS: F PTS: 1 REF: 18

8. In arithmetic statements, the rules of precedence can be overridden using parentheses.

   ANS: T PTS: 1 REF: 19

9. When you declare variables, you have the option of assigning initial values to them.

   ANS: T PTS: 1 REF: 20

10. It is more common for uninitialized variables to have an a valid default value assigned to them, than it is for them to contain an unknown, or garbage value.

    ANS: F PTS: 1 REF: 20

MULTIPLE CHOICE

1. ____ are the two major components of any computer system.
   a. Input and output
   b. Monitors and printers
   c. Keyboards and mice
   d. Hardware and software

ANS: D PTS: 1 REF: 2

2. ____ are instruction sets written by programmers.
   a. Tests
   b. Outputs
   c. Programs
   d. Inputs

   ANS: C PTS: 1 REF: 2

3. Word-processing programs, spreadsheets, payroll and inventory programs, and even games are considered to be ____.
   a. application software
   b. system software
   c. low-level programming languages
   d. high-level programming languages

   ANS: A PTS: 1 REF: 2

4. ____ comprises the programs you use to manage your computer, including operating systems such as Windows, Linux, or UNIX.
   a. System software
   b. Hardware
   c. Application software
   d. Processing software

   ANS: A PTS: 1 REF: 2

5. The ____ of a language are the rules that govern word usage and punctuation.
   a. semantics
   b. structure
   c. syntax
   d. logic

   ANS: C PTS: 1 REF: 2

6. The language translation software that converts a programmer's statements to binary form is called a ____.
   a. processor
   b. compiler
   c. translator
   d. central processing unit

   ANS: B PTS: 1 REF: 3

7. Each programming language uses a piece of software to translate programming language statements into ____.
   a. logic
   b. syntax
   c. object code
   d. semantic code

   ANS: C PTS: 1 REF: 3

8. To use a computer program, you must first load it into the computer's ____.

   a. memory
   b. monitor
   c. disk
   d. software

   ANS: A PTS: 1 REF: 5

9. A(n) ____ is the sequence of steps necessary to solve any problem.
   a. algorithm
   b. pseudocode list
   c. rhythm
   d. problem statement

   ANS: A PTS: 1 REF: 7

10. ____ is the process of walking through a program's logic on paper before you actually write the program.

a. Bench-checking
b. Bench-testing
c. Desk-checking
d. Desk-testing

ANS: C PTS: 1 REF: 7

11. ____ a program is when a programmer can execute the program with some sample data to see whether the results are logically correct.
a. Planning
b. Coding
c. Maintaining
d. Testing

ANS: D PTS: 1 REF: 9

12. The entire set of actions an organization must take to switch over to using a new program or set of programs is called ____.
a. turnover
b. renovation
c. translation
d. conversion

ANS: D PTS: 1 REF: 10

13. ___ is the process of updating programs after the programs are put into production.
a. Design
b. Implementation
c. Maintenance
d. Desk-checking

ANS: C PTS: 1 REF: 10

14. ____ is an English-like representation of the logical steps it takes to solve a problem.
a. Algorithm
b. Pseudocode
c. Code
d. Syntax

ANS: B PTS: 1 REF: 11

15. A(n) ____ is a pictorial representation of logical steps it takes to solve a problem.
a. flowchart
b. algorithm
c. source program
d. diagram

ANS: A PTS: 1 REF: 11

16. In a flowchart, you use a ____ to represent a processing symbol.
a. diamond
b. parallelogram
c. rectangle
d. triangle

ANS: C PTS: 1 REF: 12

17. ____ are named memory locations, whose contents can vary over time.

a. Named constants
b. Constants
c. Literals
d. Variables

ANS: D PTS: 1 REF: 15

18. In many modern programming languages, the equal sign is the _____.
a. sentinel value
b. assignment operator
c. magic number
d. variable

ANS: B PTS: 1 REF: 17

19. The ____ dictate the order in which operations in the same statement are carried out.

a. rules of execution
b. rules of order
c. rules of operation
d. rules of precedence

ANS: D PTS: 1 REF: 18

20. A variable's ____ describes the kind of values the variable can hold, how much memory the value occupies, and the types of operations that can be performed with the data stored there.
a. size
b. name
c. data type
d. value

ANS: C PTS: 1 REF: 19

21. A ____ variable can have mathematical operations performed on it.
a. character
b. numeric
c. pointer
d. string

ANS: B PTS: 1 REF: 19

22. A ____ variable can hold letters of the alphabet and other special characters such as punctuation marks.
a. character
b. numeric
c. string
d. alphabetic

ANS: C PTS: 1 REF: 19

23. You must always ____ a variable before you can use it for the first time in a program.
a. declare
b. reference
c. instantiate
d. announce

ANS: A PTS: 1 REF: 20

24. A(n) ____ loop is a repeating flow of logic that never ends.
a. definite
b. finite
c. circling
d. infinite

ANS: D PTS: 1 REF: 21

25. A(n) ____ value is a predetermined value that means "Stop the program!"
a. flag
b. sentinel
c. indicator
d. counter

ANS: B PTS: 1 REF: 21

26. You represent a decision in a flowchart by drawing a decision symbol, which is shaped like a ____.
a. diamond
b. parallelogram
c. rectangle
d. triangle

ANS: A PTS: 1 REF: 21

27. Programming languages can recognize the end of data in a file automatically, through a(n) ____ code that is stored at the end of the data.
a. diamond
b. exit
c. eof
d. end

ANS: C PTS: 1 REF: 22

28. An important feature of modern programming is the ability to build programs from smaller segments. This is known as ____.
    a. monolithic
    b. structured
    c. independence
    d. modularity

    ANS: D PTS: 1 REF: 24

29. ____ programming focuses on breaking down programming processes into manageable subtasks.
    a. Functional
    b. Procedural
    c. Object-oriented
    d. Structured

    ANS: B PTS: 1 REF: 24

30. ____ programming focuses on objects, or "things," and describes their attributes and behaviors.
    a. Functional
    b. Procedural
    c. Object-oriented
    d. Structured

    ANS: C PTS: 1 REF: 24

Case-Based Critical Thinking Questions

Case 1

The Billing Department manager, Anna, asked the programmer, Jerry, for a list of customers who owe the ABC Company more than $500.

31. Jerry needs to know more about the report. He asks Anna questions about what the report should look like and what other information should be included on the report. What part of the program development cycle is this?
    a. Understanding the problem
    b. Planning the logic
    c. Coding the program
    d. Interviewing about the problem

    ANS: A PTS: 1 REF: 6 TOP: Critical Thinking

32. After talking with Anna, Jerry has all the information he needs to move to the next step in the program development cycle. What is the next step?
    a. Understanding the problem
    b. Planning the logic
    c. Coding the program
    d. Installing the program

    ANS: B PTS: 1 REF: 7 TOP: Critical Thinking

33. When Jerry plans the solution to this programming problem, he will use one of two tools to help him. These tools are: ____.

    a. algorithms and flowcharts
    b. pseudocode and algorithms
    c. code and algorithms
    d. pseudocode and flowcharts

    ANS: D PTS: 1 REF: 7 TOP: Critical Thinking

34. After the program has been coded, compiled and is free of syntax errors, Jerry must now ____.
    a. translate the code
    b. test the program
    c. put the program into production
    d. maintain the program

    ANS: B PTS: 1 REF: 9 TOP: Critical Thinking

35. The program is now in production. The Billing Department manager, Anna, asks Jerry to change the report to show only customers who owe more than $500 and who are more than 30 days overdue on their payments. What part of the program development cycle is this?
    a. Planning the logic
    b. Coding the program
    c. Testing the program
    d. Maintaining the program

    ANS: D PTS: 1 REF: 10 TOP: Critical Thinking

SHORT ANSWER

1. What are the three major operations that computer hardware and software accomplish? Provide a brief explanation of each operation.

   ANS:
   Input—Hardware devices that perform input operations include keyboards and mice. Through these devices, data, or facts, enter the computer system.
   Processing—Processing data items may involve organizing them, checking them for accuracy, or performing mathematical operations on them. The hardware component that performs these types of tasks is the central processing unit, or CPU.
   Output—After data items have been processed, they become information. Information often is sent to a printer, monitor, or some other output device so people can view, interpret, and use the results. Sometimes, you store output on hardware, such as a disk or flash media that holds information for later retrieval as input for another program.

   PTS: 1 REF: 2

2. Do programmers usually create both pseudocode and a flowchart for the same problem? Why or why not?

   ANS:
   Answers will vary. Programmers seldom create both pseudocode and a flowchart for the same problem. You usually use one or the other. In a large program, you might even prefer to write pseudocode for some parts and draw a flowchart for others. When you instruct a friend how to get to your house, you might write a series of instructions, or you might draw a map. Pseudocode is similar to written, step-by-step instructions, and a flowchart, like a map, is a visual representation of the same thing.

   PTS: 1 REF: 13

3. Discuss rules for naming variables.

   ANS:
   Answers will vary. Variable names must be one word. The name can contain letters, digits, hyphens, underscores, or any other characters you choose, with the exception of spaces. No programming language allows spaces within a variable name. Variable names should have some appropriate meaning. You might think you will remember how you intended to use a cryptic variable name within a program, but several months or years later when a program requires changes, you and your fellow programmers will appreciate clear, descriptive variable names. Some programmers have fun by naming variables after friends or creating puns with the names, but such behavior is unprofessional and marks those programmers as amateurs.

   PTS: 1 REF: 16-17

4. What are the arithmetic operators?

   ANS:
   Most programming languages use at least the following standard arithmetic operators:
   + (plus sign)—addition
   – (minus sign)—subtraction
   * (asterisk)—multiplication
   / (slash)—division
   Many modern languages also include a remainder operator, which is represented by % (a percent sign).

   PTS: 1 REF: 18

5. What are the rules of precedence?

   ANS:
   Answers will vary. Every operator follows rules of precedence that dictate the order in which operations in the same statement are carried out. For example, multiplication and division always take precedence over addition and subtraction. So, in an expression such as a + b * c, b and c are multiplied, producing a temporary result before a is added to it. The assignment operator has a very low precedence, meaning that in a statement such as d = e + f + g, the operations on the right of the assignment operator are always performed before the final assignment to the variable on the left. In arithmetic statements, the rules of precedence can be overridden using parentheses.

   PTS: 1 REF: 18-19