Chapter 2: Language Design Criteria

TRUE/FALSE

1. The primary design goal of early programming languages was efficiency of execution.

   ANS: T PTS: 1 REF: 27

2. FORTRAN's designers attempted to improve the readability of programs by making the constructs look like ordinary written English.

   ANS: F PTS: 1 REF: 27

3. The most important design criterion of the last 25 years has been the goal of efficiency.

   ANS: F PTS: 1 REF: 28

4. Design goals for programming languages have not changed through the years.

   ANS: F PTS: 1 REF: 28

5. The ease with which a complex process or structure can be expressed in a programming language is called its regularity.

   ANS: F PTS: 1 REF: 29

6. Python uses statement terminators such as the semicolon.

   ANS: F PTS: 1 REF: 29

7. Early dialects of FORTRAN supported static storage allocation only.

   ANS: T PTS: 1 REF: 29

8. The presence of explicit data types in variable declarations in a language allows for more concise code.

   ANS: F PTS: 1 REF: 30

9. When applied to data types, value semantics means that assignment produces two references to the same object.

   ANS: F PTS: 1 REF: 32

10. Java demonstrates a lack of orthogonality in its different handling of primitive data types and object data types.

    ANS: T PTS: 1 REF: 32

11. Pascal uses a dedicated return statement for returning values from functions.

    ANS: F PTS: 1 REF: 32

12. Irregularities in a language may be the result of maintaining backward compatibility with a prior version of the language.

ANS: T PTS: 1 REF: 33

13. Java is considered to be a semantically safe language.

ANS: T PTS: 1 REF: 33

14. A language that adds new features via additional releases is considered to be extensible.

ANS: T PTS: 1 REF: 34

15. Macros can be used to improve the readability of a language.

ANS: T PTS: 1 REF: 34-35

16. C was chosen as the base language for C++ because it contained class constructs.

ANS: F PTS: 1 REF: 35-36

17. One of the design goals of C++ was that it would be highly portable.

ANS: T PTS: 1 REF: 36

18. C++ was not intended to undergo incremental development.

ANS: F PTS: 1 REF: 36

19. C++ was designed to be a multiparadigm language that would not enforce any one style of programming.

ANS: T PTS: 1 REF: 36

20. C++ is an open source language that has never had a commercial release.

ANS: F PTS: 1 REF: 37

21. C++ does not have a formal language definition.

ANS: F PTS: 1 REF: 37

22. Python was designed to bridge the gap between a systems language like C and a shell language like Perl.

ANS: T PTS: 1 REF: 38

23. Python is type-checked at runtime.

ANS: T PTS: 1 REF: 40

24. When no type errors are caught during execution, we can infer that they do not exist.

ANS: F PTS: 1 REF: 40

25. A program written in Python will require many more lines of code than if it were written in C++.

ANS: F PTS: 1 REF: 40

MULTIPLE CHOICE

1. The quality of a language that allows a programmer to express a computation clearly, correctly, concisely, and quickly is called _____.
a. efficiency
b. regularity
c. orthogonality
d. writability

ANS: D PTS: 1 REF: 27

2. Which of the following is a functional language?
a. Lisp
b. ALGOL
c. Python
d. FORTRAN

ANS: A PTS: 1 REF: 28

3. Which of the following is an object-oriented language?
a. C++
b. C
c. FORTRAN
d. Algol

ANS: A PTS: 1 REF: 28

4. Attempts to make programming languages more reliable led to the development of ____.
a. better documentation
b. strong data typing
c. improved writability
d. increased efficiency

ANS: B PTS: 1 REF: 28

5. A programming language's expressiveness ____.
a. refers to how easy it is to express complex processes
b. refers to the efficiency of the code
c. refers to how well its features are integrated
d. refers to its level of generality

ANS: A PTS: 1 REF: 29

6. A language achieves ____ by avoiding special cases in the use of constructs.
a. orthogonality
b. efficiency
c. generality
d. uniformity

ANS: C PTS: 1 REF: 30

7. A language is said to have the property of ____ if its constructs can be combined in any meaningful way, with no unexpected restrictions.
a. generality
b. orthogonality
c. uniformity
d. efficiency

ANS: B PTS: 1 REF: 31

8. A language is said to have the property of ____ if it has a design in which similar things look similar, and different things look different.

a. generality
b. uniformity
c. orthogonality
d. efficiency

ANS: B PTS: 1 REF: 31

9. The fact that Pascal does not allow functions and procedures to be assigned to variables indicates a lack of ____ in the language.

a. uniformity
b. generality
c. orthogonality
d. efficiency

ANS: B PTS: 1 REF: 31

10. The fact that C does not allow array types to be the return value of a function indicates a lack of ____ in the language.

a. generality
b. uniformity
c. orthogonality
d. efficiency

ANS: C PTS: 1 REF: 31

11. Which of the following is an example of lack of generality in a language?

a. In C, arrays cannot be directly compared using the == operator.
b. In Pascal, functions can return only scalar or pointer types as values.
c. In C, local variables can only be defined at the beginning of a block.
d. In Pascal, return statements in functions look like assignments to variables.

ANS: A PTS: 1 REF: 31

12. Because C++ requires a semicolon after a class definition but not after a function definition, C++ is said to lack ____.

a. orthogonality
b. security
c. reliability
d. uniformity

ANS: D PTS: 1 REF: 32

13. The irregularities of primitive types and reference types in Java is the result of the designer's concern with ____.

a. efficiency
b. orthogonality
c. regularity
d. generality

ANS: A PTS: 1 REF: 33

14. Which of the following is most closely related to reliability?

a. Generality
b. Regularity
c. Security
d. Uniformity

ANS: C PTS: 1 REF: 33

15. A language which prevents a programmer from compiling or executing any statements or expressions that violate the definition of the language is said to be ____.

a. efficient
b. uniform
c. semantically safe
d. orthogonal

ANS: C PTS: 1 REF: 33-34

16. A language that allows the user to add features to it is said to have the property of ____.

a. uniformity
b. regularity
c. extensibility
d. reliability

ANS: C PTS: 1 REF: 34

17. A ____ specifies the syntax of a piece of code that expands to other standard code.

a. compiler
b. macro
c. function
d. procedure

ANS: B PTS: 1 REF: 34

18. The first implementation of C++ used ____.

a. a compiler named Cfront
b. a preprocessor named Cfront
c. an interpreter named Cfront
d. a compiler named Cpre

ANS: A PTS: 1 REF: 36

19. C++ ____.

a. is an object-oriented language
b. is a functional type language
c. does not have an accepted set of standards
d. is not widely used

ANS: A PTS: 1 REF: 37

20. Python was originally designed for ____.

a. scientists and engineers and other non-programmers
b. expert programmers
c. large scale systems
d. time-critical systems

ANS: A PTS: 1 REF: 38

21. Which of the following properties is least exhibited by Python?

a. simplicity
b. portability
c. extensibility
d. efficiency

ANS: D PTS: 1 REF: 38-39

22. All of the following languages are statically typed except ____.

a. Ada
b. C
c. C++
d. Python

ANS: D PTS: 1 REF: 39

23. Of the following languages, which is a statically typed language?

a. Python
b. Lisp
c. Smalltalk
d. Ada

ANS: D PTS: 1 REF: 39

24. Python is easy for nonprogrammers to learn and use because ____.

a. it is based on a small but powerful set of primitive operations and data types that can be easily extended
b. it has a very rich set of data types

c. it is highly portable to multiple platforms
d. it does not support advanced abstractions

ANS: A PTS: 1 REF: 38

25. The real benefit of deferring type checking until runtime is ____.
a. greater runtime efficiency
b. greater programmer efficiency
c. higher program reliability
d. higher program safety

ANS: B PTS: 1 REF: 40