

The University of Alabama in Huntsville
Electrical and Computer Engineering
CPE 112 02
Test 4
November 29, 2001

Name: _____

True or False (2 points each)

1. _____ A switch expression can be of any simple data type.
2. _____ After execution of the code fragment

```
char ch = 'D';  
int alpha = 3;  
  
switch (ch)  
{  
    case 'A' : alpha = alpha + 10;  
              break;  
    case 'B' : alpha = alpha + 20;  
              break;  
    case 'C' : alpha = alpha + 30;  
}
```

the value of `alpha` is 3.
3. _____ The body of a Do-While loop will always execute at least once, whereas the body of a For loop may never execute.
4. _____ To avoid infinite loops, a Do-While statement's condition must be false at some time during its execution.
5. _____ Because of representational error, two floating point numbers should not be compared for exact equality.
6. _____ In the data type defined by

```
enum Colors {RED, GREEN, BLUE};
```

the enumerators are ordered such that `RED < GREEN < BLUE`.
7. _____ The values of a C++ enumeration type may be input directly.
8. _____ The members of a `struct` can be of any type except float.
9. _____ A hierarchical record is a record that contains an array as one of its members.

Fill in the Blank (2 points each)

10. In C++, the _____ statement is the looping control structure whose loop test occurs at the end (bottom) of the loop.
11. In C++, the _____ statement is the looping control structure whose body is certain to execute at least once.

12. A _____ loop is the general name given to a loop in which the loop test is positioned before the loop body.
13. _____ is the conversion of a value from a "higher" type to a "lower" type according to a programming language's precedence of data types.
14. A(n) _____ is a structured data type whose components, which may be of different data types, are accessed by name rather than by index.

Multiple Choice (3 points each)

15. _____ Which of the following represents a pretest loop?
- a. While
 - b. Do-While
 - c. For
 - d. a and b above
 - e. a and c above
16. _____ What is the output of the following code fragment? (All variables are of type `int`.)
- ```
limit = 8;
cout << 'H';
for (loopCount = 10; loopCount <= limit; loopCount++)
 cout << 'E';
cout << "LP";
```
- a. HLP
  - b. HELP
  - c. HEELP
  - d. HEEELP
  - e. none of the above
17. \_\_\_\_\_ Which of the loops below produces the same number of loop iterations as the following loop? (`count` is of type `int`.)

```
for (count = 1; count <= 10; count++)
 DoSomething();
```

- a. 

```
for (count = 10; count >= 1; count--)
 DoSomething();
```
- b. 

```
for (count = 0; count < 10; count++)
 DoSomething();
```
- c. 

```
for (count = 10; count >= 0; count--)
 DoSomething();
```
- d. a and b above
- e. a, b, and c above

18. \_\_\_\_\_ Assume you have the following declarations:

```
enum StudentType {MARY, JANE, BILL};
StudentType oneStudent;
```

and that oneStudent has been assigned some value. Which of the following outputs Jane's name if oneStudent contains the value JANE?

- a. `if (oneStudent == JANE)  
 cout << oneStudent;`
- b. `if (oneStudent == "JANE")  
 cout << StudentType(oneStudent);`
- c. `if (oneStudent == JANE)  
 cout << JANE;`
- d. `if (oneStudent == "JANE")  
 cout << "JANE";`
- e. `if (oneStudent == JANE)  
 cout << "JANE";`

19. \_\_\_\_\_ In C++, which of the following is *not* allowed as an aggregate operation on structs?

- a. assignment
- b. I/O
- c. parameter passage by value
- d. parameter passage by reference
- e. return as a function's return value

20. \_\_\_\_\_ Given the declarations

```
struct RecType1
{
 int length;
 float width;
};
struct RecType2
{
 int length;
 float width;
};
RecType1 myRec;
RecType2 yourRec;
```

which of the following assignment statements is valid?

- a. `myRec.length = yourRec.length;`
- b. `myRec = yourRec;`
- c. `myRec.length = yourRec;`
- d. a and b above
- e. none of the above

21. \_\_\_\_\_ Given the declarations

```
typedef char String19[20];
struct BrandInfo
{
 String19 company;
 String19 model;
};
struct DiskType
{
 BrandInfo brand;
 float capacity;
};
DiskType myDisk;
```

which of the following assignment statements is valid?

- a. myDisk.brand[3].company = 'X';
- b. myDisk.brand.company[3] = 'X';
- c. myDisk[3].brand.company = 'X';
- d. a and c above
- e. none of the above

22. (2 points) Name two of the five C++ integral simple types.

\_\_\_\_\_

\_\_\_\_\_

23. (10 points) What is printed by the following program fragment? (All variables are of type int.)

```
for (row = 1; row <= 5; row++)
{
 for (col = 2; col <= 5 - row; col++)
 cout << '*';
 for(col = 1; col <= 3*row - 2; col++)
 cout << ' ';
 for (col = 2; col <= 5 - row; col++)
 cout << '*';
 cout << endl;
}
```

24. (18 points) You are writing the subscription renewal system for a magazine. For each subscriber, the system is to keep the following information:

Name (first, last)

Address (street, city, state, zip code)

Expiration date (month and year)

Date renewal notice was sent (month, day, and year)

Number of renewal notices sent so far

Number of years for which subscription is being renewed (0 for renewal not yet received; otherwise, 1, 2, or 3 years)

Whether or not the subscriber's name may be included in a mailing list for sale to other companies

Write a hierarchical record type declaration to represent this information. Each subrecord should be declared separately as a named data type.

25. (15 points) Write a value-returning function that accepts a single character input and determines whether that character is a vowel (a, e, i, o, or u), sometimes a vowel (y), or not a vowel. Use an enumeration type and a switch statement.

26. (6 points) Rewrite the following For loop using a Do-While loop.

```
for (k = 9; k <= 21; k++)
 Cout << k << " " << 3 * k << endl;
```