

CS 1044 Introduction to Programming in C Test 1

Wednesday, October 9, 1996

Instructions:

- Print your name in the space provided below.
- Print your name and ID number on the Opscan form.
- Be sure to code your ID number on the Opscan form as well and to enter Form A on the Opscan form.
- Choose the best answer for each question — some answers may be partially correct.
- When you have completed the test, sign the pledge at the bottom of this page and turn in both the test and your Opscan. **Note that failure to return this test is a violation of the Honor Code.**
- There are 50 questions — each is worth 2 points.
- I suggest you mark your answers on your test sheet as well as the Opscan form for your future reference. In any case, the answers you mark on the Opscan form will be considered your "official" answers.

Do not start the test until instructed to do so!

Name _____

Pledge: On my honor, I have neither given nor received unauthorized aid on this examination.

Virginia



Tech _____

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- 1) In the C language, the semicolon (;) is a statement _____.
1) separator 2) generator 3) of affection 4) locator
5) numerator 6) terminator 7) denominator 8) none of the above
- 2) Which of the following properties should an algorithm have?
1) finiteness 2) ambiguity 3) definition of sequence
4) all of the above 5) 1 & 2 only 6) 1 & 3 only
7) 2 & 3 only 8) none of the above
- 3) Which of the following tasks are carried out by the compiler?
1) checking syntax 2) producing an executable (program)
3) checking design logic 4) all of the above
5) 1 & 2 only 6) 1 & 3 only
7) 2 & 3 only 8) none of the above

For questions 4 through 11:

- mark 1 if the statements are syntactically correct
- mark 2 if one (or more) of the statements is syntactically incorrect

Assume the given variable declarations and that any necessary #include lines are present.

```
int    fred, murray, zach;  
float  jane, lisa;  
char   fido;
```

- 4) murray = 17;
 zach = 6;
 fred = murray / zach;
- 5) lisa = 403;
 jane = lisa**2;
- 6) fred = 4/3;
- 7) fred = 4.0/3;

- 8) `fido = 'abc';`
- 9) `if (murray == 10)
 fred = zach;
 murray = 5;
else
 murray = 10;`
- 10) `if (fido == '\n') {
 cout << "That's all folks!" << endl;
}
else {
 cout << "More to come . . . " << endl;
}`
- 11) `cout >> "fred" >> endl;`

For questions 12 through 15 select the value of the given C expression or indicate that the expression is not legal (i.e., has a syntax error). Note that decimal points indicate a floating point result.

- 12) `12 / 3.0 + 5 / 2`
1) 4.5 2) 6 3) 6.0 4) 6.5
5) not legal 6) none of the above
- 13) `10 % 1 + 3 / 5`
1) 3 2) 3.0 3) 1.0 4) 4
5) not legal 6) none of the above
- 14) `10 / 3 * 9`
1) 30 2) 27 3) 30.0 4) 0.37037
5) not legal 6) none of the above
- 15) `9.0 - 6.0 / 2.0 + 3.0`
1) 9.0 2) 6.0 3) 4.5 4) 0.6
5) not legal 6) none of the above

For questions 16 through 20 select the value that will be assigned to the relevant variable or indicate that the assignment is not legal (i.e., has a syntax error). Note that decimal points indicate a floating point result.

```
int   anInt;  
float aFloat;  
char  aChar;
```

16) anInt = 5.0 / 3.0;

- 1) 2 2) 2.0 3) 2.5 4) 1
5) not legal 6) none of the above

17) aFloat = 5 / 2.0;

- 1) 2.0 2) 2.5 3) 3.0 4) 0.4
5) not legal 6) none of the above

18) aChar = "ABC";

- 1) 'A' 2) "A" 3) ABC 4) "ABC"
5) not legal 6) none of the above

19) anInt = (34 <= 50);

- 1) 1 2) 0 3) false 4) true
5) not legal 6) none of the above

20) aFloat = 15 / 6;

- 1) 2 2) 2.5 3) 2.0 4) 9.0
5) not legal 6) none of the above

Questions 21 through 26 use as standard input cin the stream:

14 7.9 1A3

and the following variable declarations:

```
int    i1 = 1, i2 = 2, i3 = 3;  
float  f1 = 1.0, f2 = 2.0;  
char   c1 = 'x', c2 = 'y';
```

For questions 21 and 22, determine the value of the indicated variable after execution of the statement:

cin >> i1 >> i2 >> i3;

21) i2

- 1) 8 2) 4 3) 7 4) 2
5) not enough information 6) none of the above

22) i3

- 1) 9 2) '.' 3) 7 4) 3
4) not enough information 5) none of the above

For questions 23 and 24, determine the value of the indicated variable after execution of the statement:

cin >> i1 >> f1 >> c1 >> c2;

23) f1

- 1) 7.0 2) 7.9 3) .9 4) 1.0
5) not enough information 6) none of the above

24) c2

- 1) '1' 2) '.' 3) 'A' 4) y
4) not enough information 5) none of the above

For questions 25 and 26, determine the value of the indicated variable after execution of the statement:

```
cin >> i1 >> i2 >> c1 >> i3;
```

25) c1

- 1) '9' 2) '.' 3) 'A' 4) 'x'
- 5) not enough information 6) none of the above

26) i3

- 1) 9 2) 9 3) 1 4) 3
- 4) not enough information 5) none of the above

27) What does the following statement print out?

```
cout << "The answer is" << setw(2) << 30 + 12;
```

- 1) The answer is 30 + 12 2) The answer is42
- 3) The answer is 42 4) Nothing --- it causes an error.
- 5) none of the above

28) Assuming the variable declarations and initializations:

```
float A = 5.0, B = 6.0;  
int I = 2, J = 3;
```

What would the program fragment below print?

```
A = B;  
J = I;  
cout << A << B << I << J;
```

(Ignore issues of spacing and formatting, just consider values.)

- 1) 5.0 6.0 2 3 2) 5.0 6.0 3 3 3) 6.0 6.0 2 2
- 4) 6.0 6.0 3 3 5) none of the above

29) What does the following cout statement print:

```
float x = 1.2;  
cout << "x squared is" << x*x;
```

- | | |
|-------------------------|------------------------------|
| 1) x squared is 1 | 2) x squared is 1.44 |
| 3) x squared is 1.2*1.2 | 4) Nothing --- syntax error. |

For questions 30 through 34, determine whether the given logical expression is:

- 1) true 2) false 3) syntactically illegal (in C)

assuming that A, B and C are declared as:

```
int A = 5, B = 2, C = 0;
```

30) (A > C - B)

31) (C != A) || (C > A + B)

32) ((A > B) && (B < C) || (C >= B))

33) (C <= B <= A)

34) (B * B <= A)

For questions 35 and 36, determine whether each logical expression is

- 1) true 2) false 3) syntactically illegal (in C)

given the declarations:

```
int i = -2, j = 0, k = 1;
```

35) i && k

36) i || k && j

For questions 37 and 38, assume the input stream is connected to a file whose first two lines are:

123456
789012

Determine the value of the variable aChar after execution of the given C code fragment. The questions are independent.

37) `char aChar = 'B';
infile.ignore(4, '\n');
infile >> aChar;`

- 1) '4' 2) '5' 3) '6' 4) '7'
5) an error would result 6) none of the above

38) `char aChar = 'B';
infile.ignore(9, '\n');
infile >> aChar;`

- 1) '5' 2) '7' 3) '8' 4) '9'
5) an error would result 6) none of the above

39) `I = 1;
if (J > K) {
 I = 2;}
L = I*2;`

Which of the following C code fragments is equivalent to the code above?
Assume all variables are declared to be of type int.

1) `I = 1;
if (J > K) {
 I = 2;}
else {
 L = I*2;}
}`

2) `I = 1;
if (J > K) {
 I = 2;
 L = I*2;}
}`

3) `I = 1;
if (J > K) {
 I = 2;
}
L = I*2;`

4) `I = 1;
if (J <= K) {
 L = I*2;
}
I = 2;`

- 5) more than one is equivalent 6) none is equivalent

Questions 40 and 41 assume the variables A, B, C and D are declared as:

```
float A = 7.5, B = 5.0, C = 7.8;  
int   D;
```

(The questions are independent.)

40) What are the values of A and B after the following is executed?

```
if (A != B) {  
    A = C;  
}  
B = C - A;
```

- 1) 2.5, 5.0 2) 2.5, 2.8 3) 7.8, 2.8 4) 7.8, 0.0
5) 7.8, 5.0 6) none of the above

41) What is the value of D after this block of code is executed?

```
if (A > B) {  
    D = 0;  
    if (C == A + B) {  
        D = 1;  
    }  
    else {  
        D = 2;  
    }  
}  
else {  
    D = 3;  
}
```

- 1) 0 2) 1 3) 2 4) 3
5) This code is invalid. 6) none of the above

42) Do the following two blocks of code always produce the same results?
(That is, for all possible starting values of J, M and N?) Assume that
all variables are declared of type int.

```
K = 0;  
if (J < K) {  
    if (M > N) {  
        K = 1;}  
    else {  
        K = 2;}  
}
```

```
K = 0;  
if ((J < K) && (M > N)) {  
    K = 1;}  
else {  
    K = 2;}  
}
```

- 1) yes 2) no 3) maybe

43) How many lines of output are generated by the following?

```
cout << "1" << "2" << "endl";  
cout << "3" << "4" << "5";  
cout << "6" << endl << "7" << "8";  
cout << endl << endl;  
cout << "9" << "0" << endl;
```

- 1) 1 2) 2 3) 3 4) 4 5) 5
6) none of the above

44) Which of the following are valid identifier names in C?

- 1) alalalalal 2) lalalalala 3) A_One
4) if 5) WiDGet
6) all of the above 7) 1 and 5 only 8) 1, 3, and 5 only
9) 1,3,4 and 5 only 10) none of the above

45) Developing a solution to a problem by breaking it down into smaller parts, which are in turn broken into smaller parts until each part can be solved in a few steps is known as the _____.

- 1) Moore-Penrose strategy 2) Newton method
3) Divide and Conquer strategy 4) none of these

46) According to Polya's 4-step process, what is the first thing to do?

- 1) Devise a plan. 2) Write C code.
3) Understand the problem. 4) Test the plan.
5) Have a Bud Light®. 6) Call 911.

47) If your program compiles without error messages and executes without a runtime error message, but produces incorrect results you should look for:

- 1) syntax errors 2) a scapegoat
3) undeclared identifiers 4) missing curly braces
5) logic errors 6) none of the above

48) What output will the following program fragment produce? Assume all variables are declared of type int.

```
score = 97;
rank  = 8;
if (score >= 95) {
    if (rank <= 5)
        cout << "Nice job!"; }
else
    cout << "Good job!";
```

- 1) Nice job!
- 2) Good job!
- 3) No output is produced.
- 4) The code has a syntax error.
- 5) None of the above

49) If your program uses the standard input stream "cin", it must contain the compiler directive(s):

- 1) #include <stdio.h>
- 2) #include <fstream.h>
- 3) #include <iostream.h>
- 4) #include <iomanip.h>
- 4) 3 & 4 only
- 5) 2 & 4 only
- 6) none of the above

50) When we refer to the semantics of a language, like C, we mean:

- 1) the rules that determine how you combine language elements to form meaningful statements
- 2) the rules that determine which header files you must include
- 3) the rules that determine what each symbol in the language means
- 4) all of the above
- 5) none of the above