

Instructions: Answer each question in the spaces provided. Please write as clearly as possible so we can understand what your answers are. No books, notes, or computers can be used for this test.

Multiple Choice - 5 points each

Circle the correct answer.

1. Which of the following is not one of the steps we went over in class for “The Software Development Method?”
 - (a) Specify the problem requirements.
 - (b) Decide what language to use
 - (c) Implement the algorithm.
 - (d) Test and verify the completed program.
2. Which of the following is *not* a valid user defined identifier?
 - (a) one_fish
 - (b) 2_fish
 - (c) redFish
 - (d) BLUEFISH
3. Which escape sequence adds a new line to the output?
 - (a) \t
 - (b) %d
 - (c) %n
 - (d) \n
4. Which of the following expressions will *not* have a type of double?
 - (a) $2 + 4 / 2$
 - (b) $2.0 + 3 / 4$
 - (c) $6 + 3.0 / 4$
 - (d) $7 * 3 * 1.0$
5. Which of the following lines of code would you use if you wanted to input a value with a decimal point (such as 1.2) from the user and store it in variable x?

- (a) `scanf("%d", x)`
- (b) `scanf("%f", &x)`
- (c) `scanf("%lf", &x)`
- (d) `scanf("%lf", &x)`

6. What will the following code fragment output?

```
int x = 5;
while (x < 9)
{
    printf("%d ", x);
}
```

- (a) 5 6 7 8
- (b) 5 6 7
- (c) 4 5 6 7 8
- (d) 5 6 7 8 9

7. You need an if statement that will compare `blah` to `bar`. If `blah` and `bar` are equal, it will increment the variable `count` by one. If they are not equal, then it should print "Not Equal."

- (a)

```
if(blah == bar)
    printf("not equal")
else
    count++;
```
- (b)

```
if(blah <> bar)
    printf("not equal")
else
    count++;
```
- (c)

```
if(blah == bar)
{
    count++;
else
```

```
        printf('not equal')
    }
```

```
(d)    if(blah != bar)
        printf('not equal')
    else
        count++;
```

8. Choose the function prototype that fits these requirements: It should take 3 arguments. The first argument is of type double. The last two arguments are integers. The function name is **fun**. The function returns an integer.

- (a) double fun(int, int, double);
- (b) integer fun(double, int, int);
- (c) int fun(double, int, int);
- (d) int fun(double, int, int)

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Short Answer

Enter the correct answer in the provided space.

9. (2 points each) Rewrite the following mathematical expressions using C functions.

Answer Box:	
a. $\sqrt{6.0 - 2.0}$	
b. $(\log_{10}(4.0))^2$	
c. $\cos(x) / \sin(x)$	
d. $x^{3.14} - \sqrt{4y}$	
e. $\frac{5.0-2.0}{6x}$	

10. (1 point each) Rewrite the following equations using compound assignment operators. If it is not possible, write “not possible.”

Answer Box: a. $x = x + 2$ b. $y = x + z$ c. $y = y - x + z$ d. $z = z * (x + y)$ e. $m = m / 2$	
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11. (1 point each) Translate each of the following expressions to C statements.

Answer Box: a. x is less than y and y is less than z b. x is true and z is equal to y c. y is greater than or equal to x and z is less than y d. z is not equal to x and y is false e. y is equal to either 3 or 4	
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12. (1 point each) Evaluate each of the following expressions, given that `flag = 1`, `a = 4`, `b = 7`, and `c = 8`. Your answers should be either true or false.

Answer Box:

a. $flag \&\&a < b$

b. $c \% b < (a - 3)$

c. $(c - 1) == b || !flag$

d. $c < b - a \&\&a! = c$

e. $!(c + a > b)$

13. (5 points) What will the following code fragment output if value = 'C'?

```
switch(value)
{
    case 'a':
    case 'A':
        printf("A is selected");
        break;
    case 'b':
    case 'B':
        printf("B is selected");
        break;
    case 'c':
    case 'C':
        printf("C is selected");
        break;
    default:
        printf("Nothing is selected.");
        break;
```

Answer:

14. (5 points) Write a code fragment that uses a for loop that print out the square of the numbers one through four. Its output should look like:

```
1
4
9
16
```

Answer:

15. (5 points) Write a function that returns nothing and doesn't have any arguments. This function should be named `compute_area`. First, it should prompt the user for one value - the length of the side of a square. It should then compute the area of the square by multiplying that value by itself. Finally, it should output this value back to the user.

Answer:

16. (10 points) If the user inputs 15 to the following program, what will the output be?

```
#include <stdio.h>
#include <math.h>

int main(void) {
    double total;
    int a, b, c;

    printf("Please enter a number:\n");
    scanf("%d", &b);

    c = b - 6;
    a = sqrt(b + 1);
    total = pow(a, 3) + sqrt(c);

    printf("The value is %f", total);
    return 0;
}
```

Answer:

17. (10 points) If the user inputs 6 and 9, what will the output of the following program be?

```
#include <stdio.h>

int answer(int x, int y);

int main(void) {
    int x, y, z;

    printf("Enter Two Numbers:\n");
    scanf("%d%d", &x, &y);

    z = answer(x,y);

    printf("The answer is %d.\n", z);

    return 0;
}

int answer(int x, int y)
{
    return y+x*y;
}
```

Answer:

18. **Bonus** (5 points) Write a function named `twice` that take two parameters: an input parameter named `in` and an output parameter named `out`. The function should multiply `in` by two and return that value in `out`. This function doesn't return anything through its return value.

Answer: