CS 10061 Midterm

Name_____

Multiple Choice. Circle the correct answer (3 points each).

1. The central processing unit of a computer consists primarily of
    a) memory and secondary storage
    b) registers and memory
    c) control unit decoder
    d) control unit and arithmetic-logic unit

2. What part of the computer provides the initial instructions to load the operating system into RAM during the startup process?
    a) the Arithmetic Logic Unit (ALU)
    b) a Read-Only Memory (ROM) chip
    c) an application program
    d) the registers

3. What is secondary storage used for?
    a) storing data and software permanently or until explicitly deleted by the user
    b) it is the part of internal memory that can be accessed by the user for writing programs
    c) storing often used instructions during the fetch-execute cycle
    d) to double the word size of the microprocessor

4. A single character of data is roughly equivalent to
    a) a bit
    b) a byte
    c) a computer word
    d) one megabyte

5. Before a high-level language program can be executed, it must first be translated into the target computer's machine language. The program that does this translation is called the
    a) compiler
    b) operating system
    c) linker
    d) loader

6. Comments in a C++ program are preceded by

a) `<<`
b) `>>`
c) `//`
d) `#`

7. The insertion operator (`<<`)

a) takes values from the input stream for storage in variables
b) puts characters in an output stream
c) causes the beginning of a new line of output
d) moves to the beginning of a new line of input

8. What is the effect of the following code fragment?

```
int num1 = 2;
int num2;
cin >> num2;

if ( num2 % num1 == 0 )
       cout << "first option" << endl;
else
       cout << "second option" << endl;
```

a) assigns the character `'%'` to the variable `num2` if `num1` is `0`, and displays `first option`
b) displays `first option` if `num1` and `num2` are equal to `0`, and `second option` otherwise
c) displays `first option` if an even number is entered as input, and `second option` if an odd number is entered as input
d) displays `first option` if `num1` and `num2` are equal and `second option` otherwise

9. What is the output of the following code fragment if the input values are 1 and 2?

```
int  x;
int  y;
cin >> x;
cin >> y;
cout << x << endl;
cout << y << endl;
```

a)
```
1
 2
```
b)
```
 1 2
```
c)
```
12
```
d)
```
xy
```

10. Which of the following directives must be included in a program in order to use C++ facilities for interactive input and screen output?

a) `#include <iostream>`
b) `#include <screenio>`
c) `#include <cmath>`
d) `#include <cstdlib>`

11. Which is the correct C++ condition to check whether the value of `x` is between `0` and `100` (inclusive) ?

a) `0 <= x <= 100`
b) `0 < x < 100`
c) `0 <= x && x <= 100`
d) `0 <= x || x <= 100`

12. What is displayed by the C++ statements that follow if the value input is 0?

```
cin >> color;
if ((color == 0) || (color == 1))
       cout << "red ";
else if (color < 2)
       cout << "blue ";
else if (color <3)
       cout << "green ";
else if
       cout << "yellow ";
cout << endl;
```

a) no output
b) `red`
c) `yellow`
d) `red blue green yellow`

13. The value of the expression below is _____ if `a` = 2, `b` = 5, and `c` = 4.

```
a * b - c > b
```

a) 6
b) 2
c) true
d) false

Questions 14–17refer to the following program fragment. Assume that all variables are of type `int` and that `y` and `z` are initialized to 0.

```
int i =0;
    while  (i < 100) {
   cin >> x;
   y = y + x;
   if ( x % 2 == 0 )
         z=z+1;
   i=i+1;
}
```

14. How many times is the loop body of the `while` statement executed?
    a) Once
    b) 99 times
    c) 100 times
    d) until a number larger than 100 is entered

15. Which variable is the loop control variable?
    a) i
    b) x
    c) y
    d) z

16. The value of variable `y` at loop exit could best be described as
    a) the sum of the values entered
    b) the number of values entered
    c) the largest value entered
    d) the average of the values entered

17. The value of `z` at loop exit could best be described as
    a) the percentage of `x` multiplied by 2
    b) the number of positive integers entered
    c) the number of even integers entered
    d) the number of odd integers entered

18. You are designing a loop that is to exit only if the values of both `x` and `y` are `0`. Which of the following would you use for your loop repetition condition?
    a) `x != 0 && y != 0`
    b) `x != 0 || y != 0`
    c) `!(x != 0) || !(y != 0)`
    d) `x == 0 && y != 0`

19. What value would be returned by the function `sum` for this call?

```
sum ( 67.58, 50.94 )
```

Definition of `sum`:

```
int sum( int num1, int num2 )
{
	return( num1 + num2 );
}
```

a) 118
b) 118.52
c) 119
d) 117

20. What is the output from this program?

```
#include <iostream>
#include <iomanip>
using namespace std;

void doSomething ( int&, int );

int main ()
{
	int	first;
	int	second;
	first = 1;
	second = 2;
	doSomething( second, first );
	cout << first << second << endl;
	return 0;
}

void doSomething( int& this, int that )
{
	int theOther;

	theOther = 5;
	that = 2 + theOther;
	this = theOther * that;
}
```

a) 35 2
b) 1 35
c) 35 7
d) 1 2

Answer the following in the space provided. Use the back of the test if necessary (8 points each)

1. Given the following environment:

```
#include <iostream>
using namespace std;

int main()
{
       int    num1;
       double num2;
       ...
```

Write a code fragment that displays a message telling the user what type of data to enter, copies into the variables `num1` and `num2` the values entered by the user, and then echoes (prints) their values to the screen.

cout << “enter an integer” << endl;
cin >> num1;
cout << “enter a floating point number” << endl;
cin >> num2;
cout << “The number you entered are “ << num1 <<“ and “ << num2 << “ respectively” << endl;

2. Write an expression to represent the following condition:

`digit` is either equal to 50 or not less than 100

(digit == 50) || !(digit < 100) or
(digit ==50) || (digit >=100)

3. Write a program fragment to extract numbers from the keyboard, compute their product, and display the result. Use the integer 0 as a sentinel.

```
product=1;
value =1;
while (value){
    cin >> value;
    if (value) product=product*value;
}
```

or

```
product=1;
value =1;
notdone=true
while (notdone){
    cin >> value;
    if (value >=0) product=product*value;
    else notdone=false;
}
```

4. Write a program fragment that uses nested loops to display the following lines

```
1  2  4  6
2  2  4  6
3  2  4  6
4  2  4  6
```

```
i=1;
while (i<=4){
    cout << i;
    i=i+1;
    int mult2=2;
    while (mult2 <=6){
        cout <<" " <<  mult2;
        mult2=mult2+2;
    }
    cout << endl;
}
```

5. Define a function named `apart` that breaks a number into its whole-number part and its fractional part. For instance, given the number 3.14, `apart` would return the values 3 and .14. Function `apart` has one type `double` input parameter and two output parameters.

```
void apart(double number, int& whole_no, double& fraction){
    whole_no=(int)number;
    fraction=number-whole_no;
}
```