Final Exam Review Answers

1. Write code to handle the following:

Enter a number 1-50: 100 That number is out of range! Enter another number: 50 The number is in range.

```
int number;
cout << “Enter a number 1-50: “;
cin >> number;

while (number < 1 || number > 50) {
  cout << “That number is out of range! Enter another number: “;
  cin >> number;
}

cout << “That number is in range.” << endl;
```

2. What is the difference between a while loop and a do-while loop?

   A while loop tests the condition first before executing the body.
   A do-while loop tests the condition after the first execution.

3. Display the word Hello 5 times using:
   a. A while loop

```
int counter = 0;
while (counter < 5) {
  cout << “Hello” << “ “ << endl;
  counter++;
}
```

   b. A do-while loop

```
int counter = 0;
do {
  cout << “Hello” << “ “ << endl;
  counter++;
} while(counter < 5);
```

   c. A for loop

```
for (int i = 0; i < 5; i++) {
  cout << “Hello” << “ “ << endl;
}
```

4. What is the output of the following?
    a.

```
int n = 5;
while(n > 5 && n <= 50) {
    cout << n << “ “;
    n *= 2;
}
```

Nothing, because 5 is outside of the range.

b.

```
int n = 0;
do {
    n++;
    cout << n << “ “;
} while(n <= 6);
```

1 2 3 4 5 6 7

c.

```
for(int i = 0; i < 3; i++) {
    cout << i + 1 << endl;
}
```

1
2
3

5. Create a function that takes in 2 numbers and displays the larger number.

```
void displayLarger(int a, int b) {
  if (a > b) {
    cout << a << endl;
  } else if (b > a) {
    cout << b << endl;
  }
}
```

6. Write a function or program to get the following output:

```
Enter two numbers: 16 5
16 is greater than 5

Enter two numbers: 5 5
The numbers are the same

Enter two numbers: 1 9
1 is less than 9
```

```
void compare(int a, int b) {
  if (a > b) {
    cout << a << " is greater than " << b << endl;
  } else if (a < b) {
    cout << a << " is less than " << b << endl;
  } else if (a == b) {
    cout << "The numbers are the same" << endl;
  }
}
```

7. Create a function that corresponds to the following main:

```
int main( ) {
    cout << "Enter a sentence: ";
    cout << displaySentence( ) << endl;

    return 0;
}

string displaySentence( ) {
  string sentence;
  getline(cin, sentence);
  return sentence;
}
```

8. What is the output of the following?

```
void display(int n) {
    n = 5;
    cout << "The value of n is " << n << endl;
}
int main( ) {
    int n = 10;
    cout << "The value of n is " << n << endl;
    display(n);
```

```
    cout << “The value of n is “ << n << endl;

    return 0;
}
```

```
The value of n is 10
The value of n is 5
The value of n is 10
```

9. What is wrong with the following statements?
    a. char c = “Z”;

        A character must have single quotes; strings have double quotes

    b. 72 = amount;

        We cannot assign like this. This is saying assign amount into 72, which is invalid. We want it to be assign 72 into amount so that correct statement is amount = 72;

10. Write code to perform the following logic: If the variable named tickets_sold is equal to 200, then set the variable sold_out to true.

```
if (tickets_sold == 200) {
  sold_out = true;
}
```

11. Write your own isdigit(char x) function to determine if an input from a user is a digit.

```
bool isdigit(char x) {
  bool valid = false;
  if (x >= 0 && x <= 9) {
    valid = true;
  }
  return valid;
}
```

12. Write your own isalpha(char x) function to determine if an input from a user a character.

```
bool isalpha(char x) {
  bool valid = false;
  if ( (x >= ‘A’ && x <= ‘Z’) || (x >= ‘a’ && x <= ‘z’) ) {
    valid = true;
  }
```

```
  return valid;
}
```

13. Find and fix the error with the following code:

```
int main( ) {
    int temp = 1;
    switch(temp) {
        case temp < 0: cout << “Temp is negative.” << endl; break;
        case temp == 0: cout << “Temp is zero.” << endl; break;
        case temp > 0: cout << “Temp is positive.” << endl; break;
}
```

We cannot call a switch case like this. Instead, it would be better to use if/else statements.

```
int temp = 1;
if (temp < 0) {
  cout << “Temp is negative” << endl;
} else if (temp == 0) {
  cout << “Temp is zero” << endl;
} else if (temp > 0) {
  cout << “Temp is positive” << endl;
}
```

14. What will the following program display?

```
int val = 5;
do {
    cout << val << “ “;
} while (val > 5);
```

5, because a do-while loop must execute at least one time

15. Write the array contents of the following instructions

```
int main( ) {
    int a[10] = { 0 };
    for(int i = 0; i < 10; i++) {
        if (i % 2 == 0) {
            a[i] = 5;
        }
    }
    a[4*2] = 9;
    a[3-2] = 3;
```

```
    return 0;
}
```

Array a:

5	3	5	0	5	0	5	0	9	0

16. Explain what pass by value and pass by reference is. Give examples of some functions implementing each.

    Pass by value is when a function cannot change the values of the parameters.
    Pass by reference is when a function is given permission to change the values of the parameters.

```
// Pass by value
void numberNotChange(int a) {
  a = 5;
}

// Pass by reference
void numberChanges(int &a) {
  a = 5;
}
```

17. Explain what the purpose of using a void function is compared to another datatype, for example an integer.

    A void function is used when there is nothing to return. The function will end when it reaches the closing bracket.
    A non void function needs something to be returned. The function will not end until something is returned.