Part I. Multiple Choices.

1. Which one of the follows is not a C++ data type?
   a. int               b. double          c. char
   d. main             e. bool            d. string

2. Declare an array to hold 10 integers.
   a. int var[0..9];       b. int var[10];
   c. int[9] var;          d. int var = new int[10];

3. Which of the following function prototypes declares a call-by-reference to an integer variable nItem?
   a. void callFunc(int nItem&);
   b. void callFunc(int& nItem);
   c. void callFunc(int* nItem);
   d. void callFunc(int nItem*);

4. To allocate dynamic array, we use int *data = new int[10]; How would you de-allocate this dynamically-allocated array?
   a. delete *data;
   b. free *data;
   c. delete data;
   d. free data;

5. Which Boolean expression is equivalent to the statement: “the cat has rabies and does not weigh 20 pounds or less”?
   a. !(catRabies == true) && (catWeight <= 20)
   b. (catRabies != true) && (catWeight >= 20)
   c. (catWeight < 20) || (catRabies == true)
   d. !(catRabies == false) && (catWeight >= 20)
   e. None of the above

Part II. Short Answers.

6. What type must x, y, z, and w be if we assign them the values 1.0, 2, 'a', and "xyz", respectively.

7. If a function is defined as int What(double x, int& y, double A[]), then which variables are passed by reference, which ones are passed by value, and what type, if any, does this function return?
8. Consider the following C++ program:

```cpp
int a, b, z;
a = 1;
b = 4;
while (a < b) {
    a = 2 * a;
b += 1;
cout<< a <<", " << b << endl;
}
z = b;
cout<< z << endl;
```

a. How many times will the program execute the while-loop?
b. What will be the output of this program be?

9. What output would be produced by the following lines (when embedded in a complete and correct program)?

```cpp
int *p1, *p2;
p1 = 42;
p2 = p1;
*p2 = 53;
p1 = new int(68);
cout<< *p1 <<", " <<*p2;
```

10. What is the value of i after execution of the given program segment?

```cpp
int i = 1;
while (i < 5) {
    i += 2;
}
```

11. What are the value of p and q after execution of the given program segment?

```cpp
int i = 10;
int j = 3;
int p = i % j;
int q = i / j;
```

12. Convert the following nested if statement into an equivalent switch statement.

```cpp
if (Grade == 'A') || (Grade == 'B')
goodGrade();
else if (Grade == 'C') || (Grade = 'D')
avgGrade();
else
    badGrade();
```
13. Determine the outputs after execution of the given program segment.

```cpp
int j=0;
for (int i=0; i<=3; i++) {
    if (j < 0) j = 1;
    else if (j > 0) j = -1;
    else j = 0;
    switch (j) {
        case 0: j = -i; break;
        case 1: j = 2*i; break;
        default: j = -2*i;
    }
    cout<< "i=" <<i <<", j=" <<j <<endl;
}
```

14. Consider the following function:

```cpp
void work(double& x, double y, int &i, int j)
{
    x = x + y;
    y = x - y;
    i = i + j;
    j = i - j;
}
double X = 1.0, Y = 2.0;
int I = 3, J = 4;
work(X,Y,I,J);
cout << X << Y << I << J;
```

a. Which parameters are value parameters, which are reference parameters?
b. What’s the output if you call the function as in `work(1, 2, 3, 4)`?

15. Write a C++ function that takes an integer array with 20 values as an input and return the max value of that array and its index within the array as reference parameters (input arguments).

16. Consider the following codes:

```cpp
int arr[10];
arr[0] = 1; arr[1] = 1;
for (int i=2; i<10; i++)
    arr[i] = arr[i-1] + arr[i-2];
```

What’s the contents of the array `arr`?