## This exam covers material from Chapters 7, 8, and 9.

1. Given the following array definition:

int values[5] = {4, 7, 6, 8, 2};

What does the following statement display?

Cout << values [4] << “ “ << (values[2] + values[3])

<< “ “ << ++values [1] << end;

1. Given the following array definition:

int numbers[5] = {1, 2, 3};

* 1. What value is stored in numbers [2]?
  2. What value is stored in numbers [4]?

1. Assume that array1 and array2 are both 25 element integer arrays. Indicate whether each of the following statements is legal or illegal and explain why:
   1. array1 = array2;
   2. cout << array1;
   3. cin >> array2;
2. Look at the following array definition:  
   double sales [8][10];
   1. How many rows does the array have?
   2. How many columns does the array have?
   3. How many elements does the array have?
   4. Write a statement that stores 3.52 in the last column of the last row in the array.
3. Write value returning function that receives the above sales array and using nested loops, returns the sum of all the elements in the array.
4. Write a declaration for an array called names to hold 20 string elements. Using a loop, initialize all the elements to the name “Sirius Black”.
5. The arrays array1 and array2 each hold 25 integer elements. Write code that copies the values in array1 to array2.
6. In a program you need to store the identification numbers of 10 employees (as ints) and their weekly gross pay (as doubles).
   1. Define two arrays that may be used in parallel to store the 10 employee identification numbers and 10 weekly gross pay amounts
   2. Write a loop that uses these arrays to print each employee’s identification number and weekly gross pay.
7. Rewrite the code for Problem 8 to define and use an array of Payroll structures instead of two parallel arrays. A Payroll structure should hold an employee ID and weekly gross pay amount.
8. Write a function that accepts the above Payroll structure and size as parameters, calculates total pay for all employees and returns the total.
9. class Rectangle

{

private:

int length, width;

public:

Rectangle()

{length = 0; width = 0;}

void setLength(int l)

{length = l;}

void setWidth (int w)

{width = w;}

};

Given the above class Rectangle, write statements to create an array of 5 rectangles and store a length of 10 and a width of 5 to the third element in the array.

1. Why is selection sort more efficient than bubble sort on large arrays?
2. Assume that empName and empID are two parallel arrays of size numEmp that hold employee data. Using a bubble sort, write the code that will sort the empID array in ascending ID number order, such that the two arrays remain parallel. That is, after sorting, for all indexes in the arrays, empName[index] must still be the name of the employee whose ID is in empID [index].
3. Assume an array exists containing 10 unsorted 3 digit account numbers. Write code to perform a linear search for account number 345.
4. Given the array definition:

const int numbers [SIZE] = {18, 17, 12, 14};

and we want to pass the array to the function processArray in the following manner:

processArray (numbers, SIZE );

Write the correct function header for the processArray function.

1. Car Class  
   Write the C++ code for a class named Car that has the following member variables:

year. An int that holds the car’s model year.  
make. A string object that holds the make of the car  
speed. An int that holds the car’s current speed  
  
In addition, the class should have the following member functions  
  
Constructor. The constructor should accepts the car’s year and make as arguments and assign these values to the object’s year and make member variables. The constructor should initialize the speed member variable to 0.  
  
Accessors. Appropriate accessor functions should be created to allow values to be retrieved from an object’s year, make, and speed member variables.  
  
accelerate. The accelerate function should add 5 to the speed member variable each time it is called.

Brake. The brake function should subtract 5 from the speed member variable each time it is called.

1. Find the errors:
   1. struct

{ int x;

double y;

};

* 1. struct Values

{ string name;

int age;

}

1. The average number of comparisons performed by linear search to find an item in an array of N elements is \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_.
2. In a binary search, after three comparisons have been made, only \_\_\_\_\_\_\_\_\_\_\_\_\_ of the array will be left to search.
3. To sort N numbers, bubble sort continues making passes through the array until \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_