

[1] [8 points] Complete the following function definition

```
double biggest( const double A[], const int sizeA)
{
    // given input of array A with sizeA elements,
    // this function returns the value of the largest
    // (most positive) value in A as the value of the
    // function.

}
}
```

[2] [5 points] Here is a main function which calls the function above:

```
int main()
{
    int size; double answer;
    double vector[100];
    //.....various statements.....;
    answer = biggest (XXXXXXXXXXXX);
    cout << answer << endl;
    return 0;
}
```

Mark which of the following would be possible replacements for XXXXX in the code above:

a: vector[100], 100

b: vector, sizeA

c: vector, 100

d: vector[100], size

e: vector, size

[3] [8 points] What is the output of the following program?

```
#include <iostream.h>

void zoom(int& x, int y)
{
    int z;
    z = x + y;
    x = z;
}

int main()
{
    int a = 1, b = 2, c = 3;
    zoom (a, b);
    cout << "one: " << a;
    a = 7; b = 4;
    zoom (c, a + c);
    cout << "two: " << a << b << c;
    return 0;
}
```

[4] [8 points] What is the output of the following code segment?

```
int j;
j = 100;
while(j > 0)
{
    j = j - 5;
    if (j/3 == 0) continue;
    cout << j << " ";
    if (j % 35 == 0) break;
}
```

[5] [10 points] Write a program that will read up to 10 letters from the keyboard into an array and will write the letters back to the screen in the reverse order. Use a period ('.') as a sentinel value to mark the end of input. There can be white space between the input letters.

For example, if the input is: a b c d .
then the output should be dcba (or d c b a)

[6] [8 points] What is the output of the following code fragment?

```
char letter[12] = {'A','B','C','D','E','F',  
                  'G','H','I','J','K','L'};  
int i = 1; int j;  
for (j=1; j < 9; j++)  
{  
    i = i + 3;  
    if (i > 10) i = i - 11;  
    cout << letter[i] << " ";  
}
```

[7] [10 points] A palindrome is any sequence of letters that is the same spelt forwards and backwards, such as "abccba" or "ewe" or "radar". Here we consider sequences containing only letters. The following function takes as input an array of letters and the size of that array, and outputs a "Yes" if the array contains a palindrome and a "No" if it does not. There is, however, one line missing in the function.....

```

void Is_a_palindrome(const char word[ ], const int size)
{
    int fail = 0; int i;
    **** MISSING LINE GOES HERE****
    {
        fail = 1;
        break;
    }
    if (fail == 1) cout << "No\n";
    else          cout << "Yes\n";
}

```

Which of the following, when inserted as the missing line, would make the function work correctly? Assume that $size \geq 2$. There may be more than one correct answer. Remember that there can be an even or odd number of characters in the array.....

- a. `for (i=0; i < (size/2); i++)`
 `if (word[i] != word[size-i])`
- b. `for (i=size-1; i >= (size/2); i--)`
 `if (word[i] != word[size-i-1])`
- c. `for (i=size-1; i > (size/2); i--)`
 `if (word[i] != word[size-i-1])`
- d. `for (i=0; i < size; i++)`
 `if (word[i] != word[size-i])`
- e. `for (i=1; i <= size; i++)`
 `if (word[i-1] == word[size-i])`
- f. `for (i=0; i <= (size/2); i++)`
 `if (word[i] != word[size-i])`
- g. `for (i=1; i <= (size/2); i++)`
 `if (word[i-1] == word[size-i])`

[8] [6 points] Which of the following are illegal identifiers, i.e. not legal names for variables (objects) in C++?

- | | | |
|---------------|------------|-----------|
| (a) character | (b) 2_big | (c) INT |
| (d) switch | (e) part_# | (f) enum |
| (g) operator | (h) a+b | (i) CONST |

[9] [4 points] What output will be produced by the following code, assuming it is embedded in a complete program?

```
int first_choice = 1;
switch(first_choice + 1)
{
    case 1:  cout << "Roast Beef\n";
             break;
    case 2:  cout << "Roast Worms\n";
             break;
    case 3:  cout << "Roast Ice Cream\n";
             break;
    default: cout << "Eat at Wendy's\n";
}

```

[10] [3 points] What output will be produced by the code above if the first line were replaced by:

```
int first_choice = 3;

```

[11] [6 points] Draw a line through any statements that are illegal in this declaration of class widget;

```
class widget
{
    public:
        int get(i);
        void print();
        void widget();
    private:
        int value;
        double answer(double val);
};
```

[12] [8 points] Given the following code fragment, what will be the output when it executes?

```
void X (int a[])
{
    int i;
    for (i = 0; a[i] > 0; i++)
        cout << " " << a[i];
    cout << endl;
}

int main ()
{
    int a[9] = { 10, 9, 8, 7, 6, -3, 3, 1, -1};
    int b[7] = { 6, 4, 2, 0, -2, 7, 5};
    X(a);
    X(b);
    return 0;
}
```

The following code will be used in questions [13] through [15]

Here is the definition of a class of Rectangle objects - the class Rect :

```
class Rect
{
    public:
        Rect();
        Rect( int j, int k);
        int get_l();
        int get_w();
        int area();
    private:
        int length;
        int width;
};

// now the definitions of the member functions

Rect::Rect() {length = -234; width = 0;}

Rect::Rect(int j, int k) {length = j; width = k;}

int Rect::get_l() { return length;}

int Rect::get_w() { return width;}

int Rect::area()
{
    return (length * width);
}
```

[13] [4 points] Consider the following program

```
#include <iostream.h>
int main()
{
    Rect a(4, 7);
    cout << a.length << endl;
    return (0);
}
```

Which of the following responses is correct?

- a.) the code is legal and outputs the value -234
- b.) the code is illegal because the operator "<<" is not defined for an operand of type `a.length`
- c.) the code is legal and outputs the value 4
- d.) the code is illegal because it cannot access `a.length`

[14] [6 points] Here is another program:

```
#include <iostream.h>
int main()
{
    int x;
    Rect box(6, 9);
    x = box.area();
    cout << x << " " << box.get_l() << endl;
    return (0);
}
```

What output is produced when this code is executed ?

[15] [6 points] And here is a third program:

```
#include <iostream.h>
int main()
{
    int one, two;
    Rect alpha;
    Rect beta(1, 2);
    one = alpha.get_l() + beta.get_l();
    two = alpha.get_w() + beta.get_w();
    cout << one << " " << two << endl;
    return (0);
}
```

What output is produced when this code is executed ?
