C++ Final Exam (Fall 2000)

Name: ______________________
ID: ______________________

• Write your answer next to question number. All other answers will be ignored.

• Note that the answers are based on C++ compiler on penguin.

True/False: (4 points each)
1. The float type will "wrap-around" when its point of overflow occurs.
2. char *msg = "Hello"; is equivalent to char *msg = {'H','e','l','l','o', '\0'};
3. The following code
   #define SQUARE(X) (X * X)
   y=SQUARE(u + v);
   
is equivalent to
   y=(u + v)*(u + v).
4. The null pointer, NULL is defined in <stdio.h> and is guaranteed to be an invalid address.
5. The string length (strlen()) of the following is 6.
   char txt[] = { 'C', 's', '\t', '7', '4', '\n', '\0' };

Multiple Choice: (4 points each)
1. What would be printed by the following statements?
   #include <iostream.h>
   int f(int &i)
   {
     i = 10;
     return(5 * i);
   }
   int main()
   {
     int n = 5;
     f(n);
     cout << n << endl;
     return 0;
   }
   (a) 5
   (b) 10
   (c) 9
   (d) 10
   (e) None of the above.
2. What would be printed by the following statements?
   int y[3][3] = {{1, 2, 3},
                 {4, 5, 6},
                 {7, 8, 9}};
   cout << y[1][2];
   (a) 5
   (b) 6
   (c) 2
   (d) 4
3. What would be printed by the following program?
   #include <iostream.h>
   int sub1(int &n)
   {
     n--;
     return n;
   }
   int main()
   {
     int m = 10;
     for(int j = 0; j < 10; j++)
       m -= sub1(j);
     cout << m << "\n";
     return 0;
   }
   (a) 0
   (b) 1
   (c) 9
   (d) 10
   (e) None of the above.
4. Which operator has the highest precedence?
   (a) .
   (b) *
   (c) []
   (d) &
5. What would be printed by the following statements?
   double *pt;
   double a[3]={1.2, 2.3, 3.4};
   pt=&a[1];
   pt+=1;
   cout<<*pt<<endl;
6. What would be printed by the following statements?

```c++
int k;
double j;
k = 2;
j = 2.0;
if(k == j){
    cout << "Okay."
} else {
    cout << "Not okay."
}
```

(a) Okay. Not okay.
(b) Not okay.
(c) Okay.
(d) Nothing will be outputed.

7. Given a program as follows, what would be printed?

```c++
#include <iostream.h>
int myfunc(double);
int myfunc(float);
int main()
{
    cout << myfunc(3.51) << "\n"
    return 0;
}
```

```c++
int myfunc(double n)
{
    return n * 2.0;
}
```

```c++
int myfunc(float n)
{
    return n * 3.0;
}
```

(a) 7
(b) 7.02
(c) 10
(d) 10.53
(e) None of the above.

8. Which statement is equivalent to the following statement?

```c++
pt->x_center = 10.0;
```

(a) *pt.x_center = 10.0;
(b) (*pt).x_center = 10.0;
(c) (*pt.x_center = 10.0;
(d) (pt->)x_center = 10.0;
(e) None of the above.

9. What would be printed by the following statements?

```c++
class complex {
    public:
        double re, im;
};
```

```c++
complex x, y;
x.re = 4.0;
x.im = 5.0;
y = x;
x.re = 5.0;
cout << y.re << "end1;"
```

(a) 4.0
(b) 4
(c) 5.0
(d) 5
(e) None of the above.

10. What do the following two cout statements print out?

```c++
{
    int i = 1;
double x = 1.111;
cout << i << " " << x << "\n";
    {
        int x = 2;
double i = 2.222;
cout << i << " " << x << "\n";
    }
}
```

(a) 1 1.111 2 2
(b) 1 1 2.222 2
(c) 1 1.111 2.222 2

11. What would be printed by the following program?

```c++
#include <iostream.h>
```
int sum(int pt[], int n)
{
    int temp = 0;
    for (int i = 0; i < n; ++i) {
        temp += pt[i];
    }
    return temp;
}

int main()
{
    int total;
    int pt[5];
    for (int i = 0; i < 5; i++)
        pt[i] = i;
    total = sum(pt, 3);
    cout << total << " " << i << endl;
    return 0;
}

(a) 3 5
(b) 3 3
(c) 6 5
(d) 10 3

12. Which of the following statements contains a reference declarator?
(a) int *i;
(b) swap(&x, &y);
(c) int x, *pt; pt = &x;
(d) int x, &pt = x;
(e) None of the above.

13. What would be printed by the following statements?
double x = !0 * (1 / 3 * 3.0);
cout << x << endl;
(a) 0
(b) 0.0
(c) 1
(d) 1.0
(e) None of the above.

14. Which is an incorrect initialization?
(a) char plant[] = "Tree";
(b) char plant[] = {‘T’,’R’,’E’,’E’};
(c) char plant[80] = "Tree";
(d) char plant[] = {‘T’,’R’,’E’,’E’,’E’,’\0’};
(e) None of the above.

15. What would be printed by the following program?
#include <iostream.h>
double triangle(double base, double height = 10.0)
int main()
{
    cout.setf(ios::showpoint);
    cout << triangle(10.0) << "\n";
    return 0;
}
double triangle(double base, double height)
{
    return 0.5*base*height;
}
(a) 50
(b) 50.0
(c) 50.00
(d) 50.0000
(e) Compilation/Linkage error.
Short Essay:

1. (6 points each) How do you dynamically (a) allocate and (b) deallocate a float array X[5] by using new and delete operators?

2. (14 points each) Please complete the following program (by filling in lines 2, 6, 17, 24, 27, 28, 38) so that it will read data from the file test.dat and print out the data.

```cpp
#include <iostream>

#define MAX 10

public:
    char name[25];
    int Ex1, Ex2;
};

int main()
{
    Student st[MAX];
    int count = 0;
    
    if (!in)
    {
        cout << "Cannot open test.dat.\n"
        return 1;
    }
    
    while(!in.eof())
    {
        cout << st[count].name << " " << st[count].Ex1 << " " << st[count].Ex2 << "\n";
    }
}
31    count++;  
32    if (count >= 10)  
33    {  
34        cout << "Exceed MAX: " << MAX << endl;  
35        in.close();  
36        return(-1);  
37    }  
38  
39  
40  
41  
42  
43  

The input file test.dat contains the following data:

Eric  77  87
Scott  90  94
Mary  100  100