

Practice Final Exam

11 December 2012

You have up to 2 hours. You may not use textbook, notes, or the computer. You may use a simple calculator, if necessary.

1. In each of the following code fragments, what is the size of the allocated array?

```
int xs[] = { 3, 4, 5 };    // _____
```

```
const int SIZE = 8;  
int ys[SIZE] = { 3, 4 }; // _____
```

```
char wizard[] = "Merlin"; // _____
```

```
const int MAX = 24;  
char title[MAX] = "Admiral Grace Hopper"; // _____
```

2. In the following code fragment,

```
int x = 92;  
int *p = &x;
```

what is the purpose of the '*' character?

- It dereferences (follows) the pointer p, arriving at the variable to which it points.
 - It declares p is a pointer to an integer.
 - It is the symbol for multiplication.
 - It ensures that p is a constant.
3. In the following code fragment,

```
void f(const char *mesg, int& count);
```

what is the purpose of the & character?

- It takes the address of a variable.
 - It is the Boolean AND operator.
 - It is a syntax error.
 - It makes count a reference parameter.
 - It ensures that count is non-negative.
4. Describe the error in the following code fragment:

```
int zz[5] = { 1, 2, 4, 8, 16 };  
for(int i = 0; i <= 5; i++) {  
    cout << zz[i] << "\n";  
}
```

5. The following program contains two void functions. What does it output?

```
void blan();
void brun();

int main() {
    blan(); brun(); blan();
    cout << "\n";
    return 0;
}

void blan() {
    cout << "BL";
    brun();
    cout << "!";
}

void brun() {
    cout << "BRB";
}
```

6. The following program uses nested function calls with return values. What is its output?

```
int zig(int x) {
    if(x%2 == 0) {
        return x/2;
    }
    else {
        return x+1;
    }
}

int zag(int y) {
    return y*3;
}

int main() {
    cout << zig(3) << "\n";
    cout << zag(4) << "\n";
    cout << zig(zag(5)) << "\n";
    cout << zag(zig(zag(6))) << "\n";
    return 0;
}
```

7. The following program fragment uses an array. What does it output?

```
const int SZ = 5;
int g[SZ];
for(int i = 0; i < SZ; i++) {
    g[i] = i+2;
}
for(int i = SZ-1; i > 0; i--) {
    cout << g[i] << "\n";
}
```

8. The following program contains a function with a reference parameter. What is the output?

```
void embiggen(int & x) {
    x *= 2;
    cout << x << "\n";
}

void plurify(int y) {
    y *= 2;
    cout << y << "\n";
}

int main() {
    int a = 3;
    int b = 4;
    embiggen(a);
    plurify(b);
    embiggen(b);
    plurify(a);
    cout << a << "\n";
    cout << b << "\n";
    return 0;
}
```

9. The following program contains a function with an array parameter. What does it output?

```
void smidgen(int x[], int stop) {
    for(int i = 0; i < stop; i++) {
        x[i]++;
    }
}

int main() {
    const int SIZE = 5;
    int z[SIZE] = { 3, 1, 8, 4, 2 };
    smidgen(z, 2);
    smidgen(z, 4);
    smidgen(z, SIZE);
    for(int i = 0; i < SIZE; i++) {
        cout << z[i] << " ";
    }
    cout << "\n";
    return 0;
}
```

10. The following program manipulates a string. What does it output?

```
const int MAX = 40;
char mesg[MAX] = "C is fun.";
cout << mesg << "\n";
mesg[4] = mesg[8] = 's'; // multiple assignment
mesg[2] = mesg[1] = '+';
mesg[3] = ' ';
mesg[5] = 't';
cout << mesg << "\n";
```

11. The following program fragment manipulates a string. What does it output?

```
char name[] = "Bartholomew J. Simpson";
name[4] = '\0';
cout << name << "\n";
```

12. The program fragment includes a string and a strange loop. What does it output?

```
char mesg[] = "Eunrj_oByr_eYaok";
for(int i = 0; i < 16; i += 2) {
    cout << mesg[i];
    if(i == 14) {
        i = -1;
    }
}
cout << "\n";
```