

Directions: *Show your work on this page* and put the answer in the space after the hand (☞).

Question 1

Draw a diagram showing the variables AND write down the output of:

```
int main()
{
    int    m, n;
    int    *p1, *p2;

    p1 = &m;
    p2 = &n;
    *p1 = 3;
    *p2 = 5;
    cout << m << " " << n << endl;
}
```

10: draw m, n, p1, p2 with values and arrows
4 pts: one per variable
2 pts: one per arrow
2 pts: one per value (3, 5)
2 pts: correct output : 1 per val

☞ _____

Question 2

Draw a diagram showing the variables AND write down the output of:

```
int f(int*);
int main()
{
    int    m = 6, n;

    n = f( &m );
    m = f( &n );
    cout << m << " " << n << endl;
}
int f(int* z)
{
    return 3 + *z ;
}
```

7: draw m, n, z with values and arrows
3 pts: one for m, n, z
2 pts: function call correct
2 pts: correct output, 1 per val

☞ _____

Question 3

Draw a diagram showing the variables AND write down the output of:

```
struct Person {
    string name;
    int    age;
};
int main()
{
    Person x = { "Lee", 19 };
    Person y = { "Jan", 20 };
    Person *p, *q;
    p = &x;
    q = &y;
    (*p).age++;
    (*q).age += 3;
    x.name = (*q).name ;
    (*q).name = "Rob";
    cout << x.name << " " << x.age << endl
         << y.name << " " << y.age << endl;
}
```

18: draw two structs, 2 ptrs
4 pts: one per variable
2 pts: one per arrow
4 pts: one per value
4 pts: one per operation
4 pts: one per val

☞ _____

Total: ____ / 35 pts