

Name: _____

Directions: **Work only on this sheet** (on both sides, if needed). MAKE SURE TO COPY YOUR ANSWERS TO A SEPARATE SHEET FOR SENDING ME AN ELECTRONIC COPY LATER.

On all Tests, 32-bit word size on Intel machines running Linux is assumed unless otherwise stated.

- (20) A C's **return** is translated to a certain machine/assembly language instruction. What is its name?
- (25) Suppose we are debugging the code on pp.64-65. Then names such as **sum** and **top** will be available to us from our debugging tool if we had used the _____ option at the time we assembled the program.
- (25) Consider the function

```
int f(n)
{
    int k;
    k = n * f(n-1);
    return k;
}
```

Suppose at runtime the operating system has allocated 600 words for our stack, and that we do not have write permission for the first word below (i.e. at a smaller address) the stack space. Say the stack is empty, and we make the call **f(100)**. Then we will get a seg fault on the _____th (or *st* or *rd* or *nd*) call to **f()**; fill in the blank, using an R expression as your answer.

- (30) Suppose several local variables in a C source file are declared this way:

```
int x = 5;
static y, z = 12;
// equiv. to static int y,z=12;
```

Then probably:

- (10) The variable **x** will be stored in _____
- (10) The variable **y** will be stored in _____
- (10) The variable **z** will be stored in _____

Solutions:

1.

ret

2.

—gstabs

- Each call expands the stack by 4 words (1 for argument, 1 for local, 1 for bread crumbs, 1 for saved EBP), so 150 calls will fill the stack, and the 151st will cause a seg fault.

4.a in the stack

4.b in a **.comm** segment

4.c in a **.data** segment