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.

1. (20) A C’s return is translated to a certain machine/assembly language instruction. What is its name?

2. (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.

3. (25) Consider the function

```c
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.

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

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

Then probably:

(a) (10) The variable x will be stored in ________________.

(b) (10) The variable y will be stored in ________________.

(c) (10) The variable z will be stored in ________________.

Solutions:

1. ret

2. -gstabs

3. 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