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. (15) The name for the Intel stack pointer register is _____.

2. (20) Suppose we wish to call **scanf()** from **x.s**. Then instead of running **as**, it's more convenient to run _____ because the latter will automatically link in the C _____.

3. (20) Suppose there is a certain C language function, **f()**, with type **int**, i.e. it has an integer return value. Suppose the compiler produces code in which the return value is held in ECX during intermediate computation. Fill in the blank in the code below, which shows what the compiler produces near the end of the function.

```
movl _____ , _____
ret
```

4. I ran the code in pp.137-139 with GDB. Here is part of my session:

```
Breakpoint 1, addone () at AddOne.s:25
25          push %ebx
(gdb) n
30          movl 8(%esp), %ebx
(gdb) n
32          incl (%ebx)
# need the (), since the argument was an address
(gdb) info registers
eax          0xbffff7e4      −1073743900
ecx          0xcbe07bea      −874480662
edx          0x1      1
ebx          0x804a020       134520864
esp          0xbffff718      0xbffff718
ebp          0xbffff738      0xbffff738
esi          0x0      0
edi          0x0      0
eip          0x8048439
0x8048439 <addone+5>
eflags       0x200282 [ SF IF ID ]
cs           0x73      115
ss           0x7b      123
ds           0x7b      123
es           0x7b      123
fs           0x0      0
gs           0x33      51
```

(a) (15) At what address is the return address (the "bread crumbs") stored?

(b) (15) At what address is **x** (in the main program) stored?

(c) (15) During the execution (not fetch) of the **incl** instruction, what value(s) will be placed on the data bus?

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