#1. Order the following storage elements/types from fastest to slowest

A) RAM (Main Memory)  
B) L1 cache  
C) Registers  
D) Hard disk  
E) L2 cache  
F) Tape

_____ (Fastest)
_____
_____
_____
_____
_____ (Slowest)

List the 2 main events that would cause a full context switch:

1)
2)

The ________________ is responsible for ensuring all symbols are known/defined.

The ________________ is responsible for getting an executable from disk into memory and ready to run.

The ________________ is responsible for combining all object files into a single executable file.

How many bits are needed in a SPARC Format 3 instruction to encode a specific register?  ________

How many bits are available in a SPARC Format 3 instruction to encode an immediate constant?  ________

#2. What gets printed if the following function is invoked as `recurse( 3, 6 )`?

```c
int 
recurse( int a, int b ) {
    int local = a + b;
    int result;
    if (local <= 12)
        result = recurse( a + 1, b ) + local;
    else
        result = local;
    printf( "%d\n", result );
    return result;
}
```

(over)
#3. Given the following program, reorder the printf lines so that the values that are printed are sorted from smallest to largest if compiled and run on a Sun SPARC architecture. These lines print out the address of the different parts of the program (not the values assigned) with the printf() format specifier %p.

```c
int a = 420;

int main( int argc, char *argv[] ) {
    static int b;
    int c = 404;
    /* 1 */ (void) printf( malloc --> %08p
"", malloc(50) );
    /* 2 */ (void) printf( c --> %08p
"", &c );
    /* 3 */ (void) printf( b --> %08p
"", &b );
    /* 4 */ (void) printf( a --> %08p
"", &a );
    /* 5 */ (void) printf( main --> %08p
"", main );
    /* 6 */ (void) printf( argc --> %08p
"", &argc );
}

This line number would print the smallest value

__________

This line number would print the largest value

__________

What question would you most like to see on the Final Exam? (1 pt)