Problem #1 [8 points]

CPI (A)	**1.1**

CPI (B)	**1.25**

F_B/F_A	**(1.2*1.25)/(1*1.1) = 1.3636**

(New execution time = 6*E8*1.1*1ns) = 0.66)

Speedup (A)	**1.1/0.66 = 1.67**

Speedup (B)	**1.5/0.66 = 2.27**

Problem #2 [8 points]

Execution Time (single processor)	**[(1.28*12)+(2.56*1)+(.256*5)]*0.5 = 9.6 s**

Execution Time (4 processors)	**[(1.28*12/(0.7*4))+(2.56/2.8)+(.256*5)]*0.5 = 3.84 s**

Problem #3 [9 points]

$t2	**BABEFEF8**

$t2	**AAAAAAA0**

$t2	**00005545**

Problem #4 [8 points]

srl	$t0, $t0, 11	T0			
sll	$t0, $t0, 26				T1
ori	$t2, $0, 0x03ff	31..26	25…17	16…11	10….0
sll	$t2, $t2, 16				
ori	$t2, $t2, 0xffff				
and	$t1, $t1, $t2				
or	$t1, $t1, $t0				

Problem #5 [12 points]

$S2	**20**

```
while (i > 0)
{
    j += 2;
    i--;
}
```

Number of MIPS Instructions:	**5N + 2**

Problem #6 [8 points]

Address of **EXIT** (*Hex*)	**004000B4**

Instruction encoded (in *Hex*) as	**08100018**

Problem #7 [20 points]

1		Move	$t0, $0
2	REPEAT1:	Slt	$t2, $t0, $s0
3		Beq	$t2, $0, EXIT1
4		Move	$t1, $0
5	REPEAT2:	Slt	$t3, $t1, $s1
6		beq	$t3, $0, EXIT2
7		Sll	$t4, $t1, 4
8		add	$t4, $s2, $t4
9		add	$t5, $t0, $t1
10		sw	$t5, 0($t4)
11		addi	$t1, $t1, 1
12		j	REPEAT2
13	EXIT2:	addi	$t0, $t0, 1
14		j	REPEAT1
15	EXIT1:		

Number of MIPS Instructions:	**153**

Problem #8 [12 points]

N in decimal is:	**-464**

M in floating-point	**1 1000 0111 000 0000 0111 0000 0000 0000**	**C3807000**

L in decimal is:	**-1000**

Problem #9 [15 points]

MIPS Code		
Prob6:	addi	$sp, $sp, -8
	sw	$ra, 0($sp)
	sll	$v0, $a0, 2
	Sw	$v0, 4($sp)
	addi	$t0, $0, 3
	blt	$a0, $t0, EXIT
	addi	$a0, $a0, -1
	jal	Prob6
	lw	$t0, 4($sp)
	add	$v0, $v0, $t0
EXIT:	lw	$ra, 0($sp)
	addi	$sp, $sp, 8
	jr	$ra