Lee

1. a. that is R-type instruction

b. because opcod = 0x33. so that meaning add
x6 will be the result.
the answer is add x6 x7 x5.

c. 0x33 = 0110011. opcode.
0x0 = 000 funct 3.
0x20 = 0100000 funct 7.
5 = 00101. rs 5
7 = 00111 rs 7.
6 = 00110. rd

question 2 is on the second page

3. x10 = g. x11 = h. x12 = i x15 = j

```
add  x28, x10, x11
sub  x28, x28, x12.
sub  x29, x10, x11
add  x29, x29, x15
add  x10, x28, x29.
jalr x0, 0(x1)
```

4.

CPi	Fi.
70%	2
0.1	6
0.2	7.

Avg CPI = 0.7x2 + 0.1x6 + 0.2x3
= 1.4 + 0.6 + 0.6
= 2.6.
CPI Avg = 2.6

Instruction per cycle = $\frac{1}{2.6}$ = 0.38461.

0.7 x 2.6 = 1.82.

1.82 = 0.7x new CPI + 0.1x6 + 0.2x3.
0.7 = 0.7x new CPI
new CPI = 1.079.

0.7 x 2.6 = 1.3.
1.3 = 0.7x new Avg CPI + 1.2
0.1 = 0.7x new CPI
new CPI = 0.1429.

Users > zhulongyu > Desktop > ASM 2GA3 A2Q2.s

```
1   fib(int):
2       addi sp, sp, -32; # sp =sp1 -32mm
3       sw ra, 28(sp)
4       sw s0, 24(sp) #
5       sw s1, 20(sp)
6       addi s0, sp, 32; # s0 =sp1 32mm
7       sw a0,-20 (s0)
8       lw a5, -20(s0)
9       bne a5,zero,.L2
10      li a5,0
11      j .L3  # jump to .L3
12  .L2:
13      lw a4,-20(s0)
14      li a5,1
15      bne a4,a5,.L4
16      li a5,1
17      j .L3  # jump to .L3
18  .L4:
19      lw a5.-20(s0)
20      addi a5,a5, -1
21      call fib(int)
22      mv s1,a0
23      lw a5,-20(s0)
24      addi a5, a5, -2
25      mv a0,a5
26      call fib(int)
27      mv a5,a0
28      add a5,s1,a5
29  .L3:
30      mv a0,a5
31      lw ra,28(sp)
32      lw s0,24(sp)
33      lw s1,20(sp)
34      addi sp,sp,32
35      jr ra
36
```