Problem 1. A local junk yard offers older CPUs with non-Beta architectures that require several clocks to execute each instruction. Here are the specifications:

Clk/Sec Clk/Ins Ins/Sec

Model	Clock Rate	Avg. clocks/Inst.
x	40 Mhz	2.0
y	100 Mhz	10.0
z	60 Mhz	3.0

40/2 = 20 M
100/10 = 10 M
60/3 = 20M

You are going to choose the machine which will execute your benchmark program the fastest, so you compiled and ran the benchmark on the three machines and counted the total instructions executed:

x: 3,600,000 instructions executed — 3.6 M / 20M = 0.18 sec
y: 1,900,000 instructions executed — 1.9 M / 10M = 0.19 sec
z: 4,200,000 instructions executed — 4.2 M / 20M = 0.21 sec

Based on the above data which machine would you choose?

x fast.

Problem 2.

A. What does the following piece of Beta assembly do?

```
I = 0x5678
B = 0x1234
LD(I,R0)        MOVE MEM[I] to REG[R0]
SHLC(R0,2,R0)   REG[R0] = REG[R0] x4
LD(R0,B,R1)     MOVE MEM[B+REG[R0]] to REG[R1]
MULC(R1,17,R1)  REG[R1] x= 17
ST(R1,B,R0)     MOVE REG[R1] to MEM[B+REG[R0]]
```

B. What is the result stored in R0?

∴ It uses B as one array, I as index for element, and multiplies B[I] by 17.

↳ four times the content MEM[I].

Problem 3.

You are given that the word at memory address 0 has a binary form of

00000100000000110000001000000001

A. What is the byte stored in address0, 1, 2 and 3, respectively?

B. What are the hexadecimal forms of the bytes?

1, 2, 3, 4

0x01, 0x02, 0x03 0x04

0000 0001 0000 0010 0000 0011 0000 0100

∴ word = 04 03 02 01 right to left.