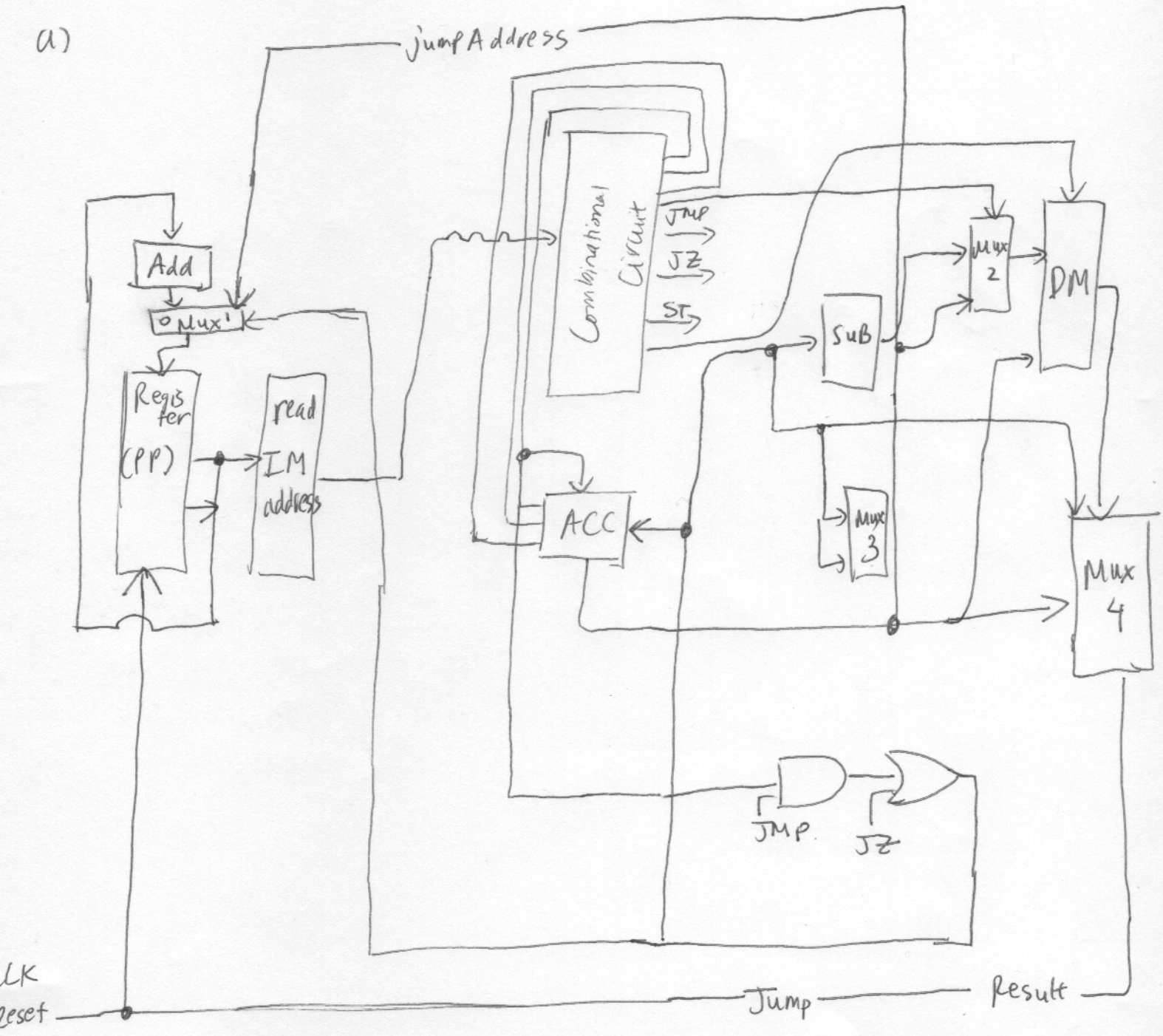
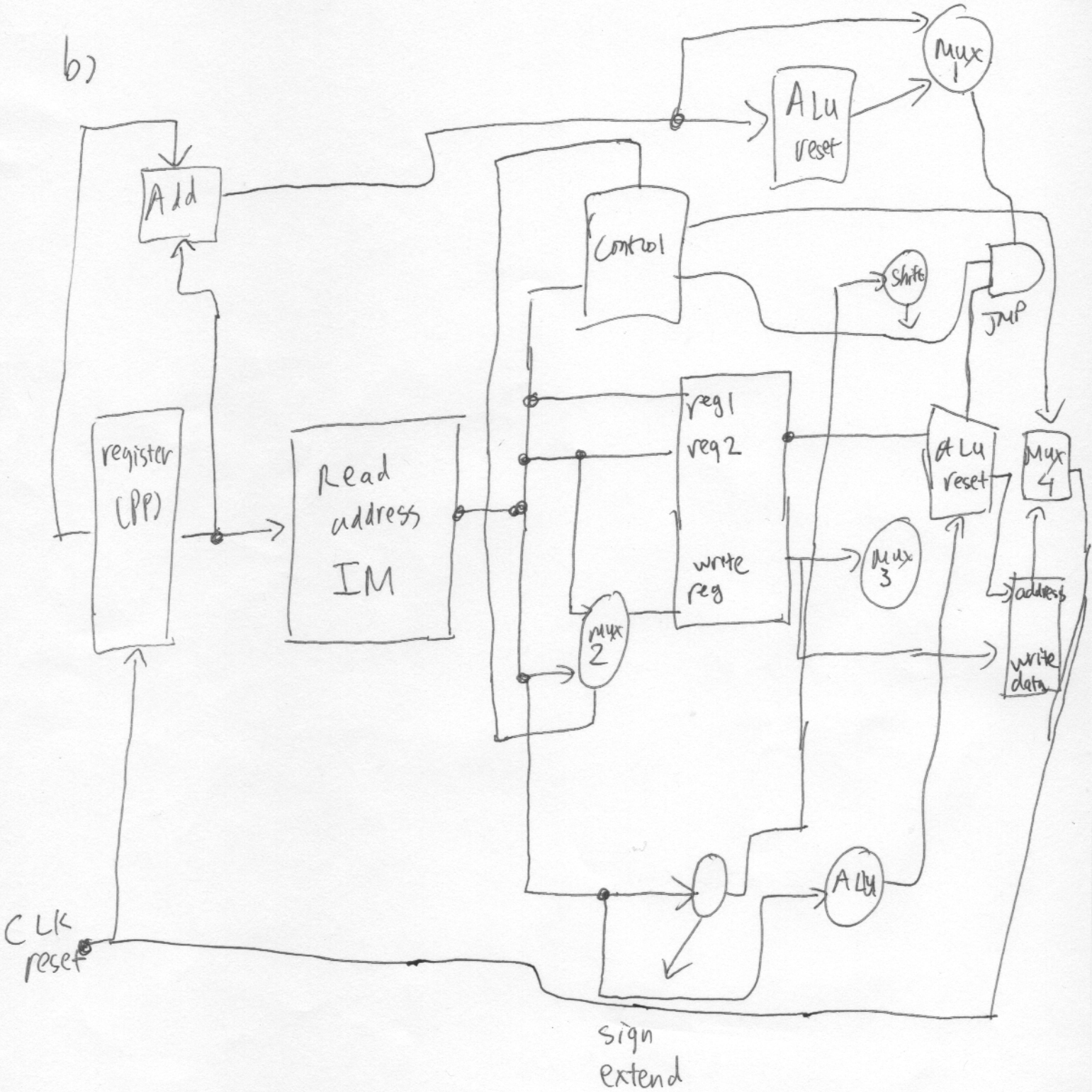
Thinh Nguyen
CSC 137
HW6-CH8

Problem 8.3

(a)



b)


Mux 1
ALU reset
Add
Control
Shift
JMP
register (PP)
Read address IM
reg1
reg2
write reg
ALU reset
Mux 4
Mux 3
Mux 2
address
write data
ALU
CLK
reset
sign extend

Problem 8.2

LD data // Acc ← data

LD (adrs) // Acc ← Memory [adrs]

ST (adrs) // Memory [adrs] ← Acc

ADD (adrs) // ACC ← ACC + Memory [adrs]

XOR (adrs) // ACC ← ACC ⊕ Memory [adrs]

a) Code:

```
LD   ACC, -2      // X = -2
ADD  ACC, 6       // Y = 6
ADD  ACC, 11      // Z = 11
ST   T, ACC       // T = X+Y-Z
EXIT
```

b) instruction:

+> -2 moves to a accumulator

+> 6 ~~addedacc~~ added to accumulator and result is stored

+> After that -11, is added to accumulator

+> The result of that contents of accumulator is sent to T

Problem 8.1

a)

LD data // ACC ← data

LD (adrs) // ACC ← adrs

SUB data // ACC ← ACC − data

ADD data // ACC ← ACC + data

XOR data // ACC ← ACC ⊕ data

SUB (adrs) // ACC ← ACC − Memory (adrs)

ADD (adrs) // ACC ← ACC + Memory (adrs)

XOR (adrs) // ACC ← ACC ⊕ Memory (adrs)

ST (adrs) // M (address) ← ACC

JMP adrs // PP ← adrs

JZ adrs // PP ← adrs if ACC = 0

b)

LD ACC, −5 // −5

~~ADD ACC, A~~

SUB ACC, A // −A

ADD ACC, B // +B

XOR ACC, C // ^C

ST T, ACC // T = (−5 − A + B) ^ C

EXIT

c) Instructions:

+) -5 moves to a accumulator

+) A subtracted to accumulator and store the result

+) Then B is added to accumulator

+) Then C is sent to accumulator

+) The result of contents of accumulator is sent to T

d) CPU data path: