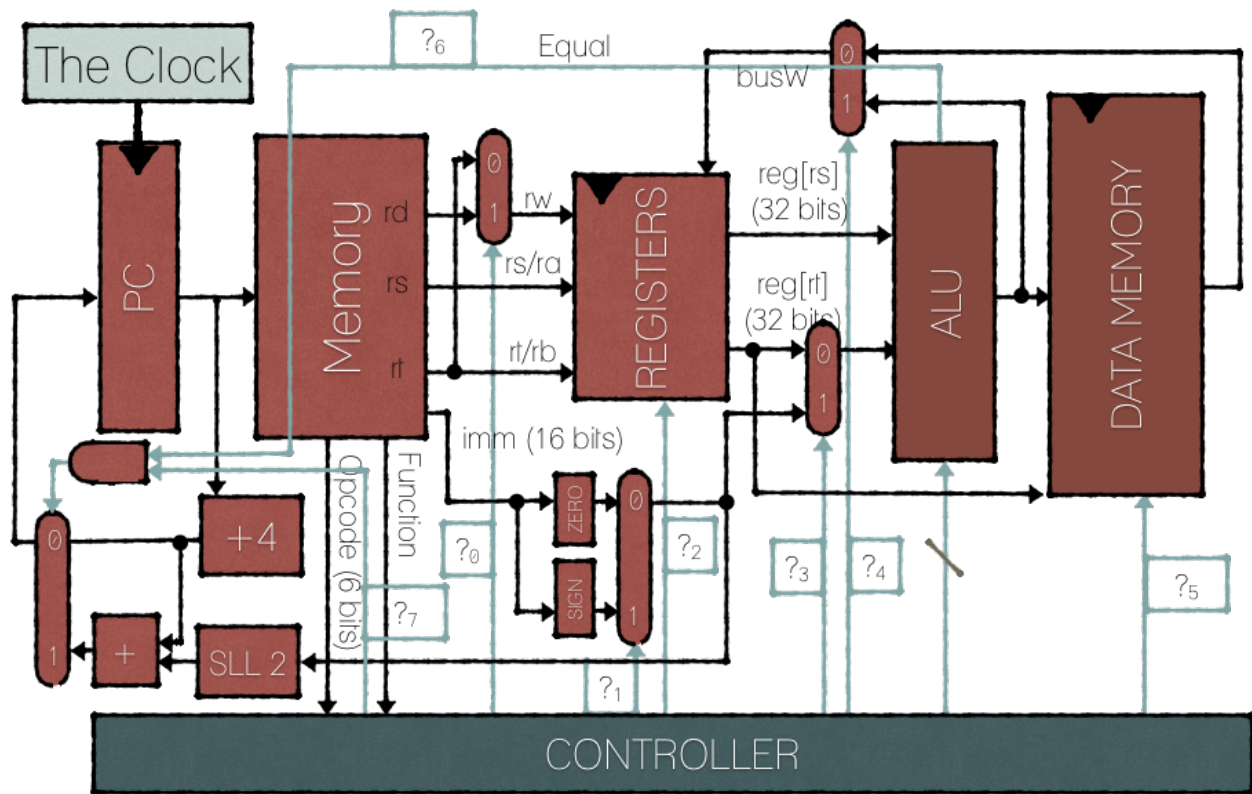


Q1) Given that the value of register \$s0 is 100, the value of register \$s1 is 50, and the value of register \$s2 is 100, fill the table below



	? ₀	? ₁	? ₂	? ₃	? ₄	? ₅	? ₆	? ₇
add	1	X	1	0	1	0	X	0
beq \$s0, \$s1, L1	X	1	0	0	X	0	0	1
sw/sh/sb	X	1	0	1	X	1	X	0
lw	0	1	1	1	0	0	X	0
beq \$s0, \$s2, L2	X	1	0	0	X	0	1	1
lw/wh/lb	0	1	1	1	0	0	X	0
ori	0	0	1	1	1	0	X	0

Q2) Given the table below, answer the following question.

Instr	Instr fetch	Register read	ALU op	Memory access	Register write	Total time
lw	200ps	100 ps	200ps	200ps	100 ps	800ps
sw	200ps	100 ps	200ps	200ps		700ps
R-format	200ps	100 ps	200ps		100 ps	600ps
beq	200ps	100 ps	200ps			500ps

How long (in picoseconds) would it take to finish executing 1 instruction without pipelining our CPU?

800 picoseconds

How long (in picoseconds) would it take to finish executing 2 instructions without pipelining our CPU?

1600 picoseconds

How long (in picoseconds) would it take to finish executing 1 instruction with pipelining our CPU?

$200 * 5 = 1000$ picoseconds

How long (in picoseconds) would it take to finish executing 2 instructions with pipelining our CPU?

$200 * 5 + 200 = 1200$ picoseconds