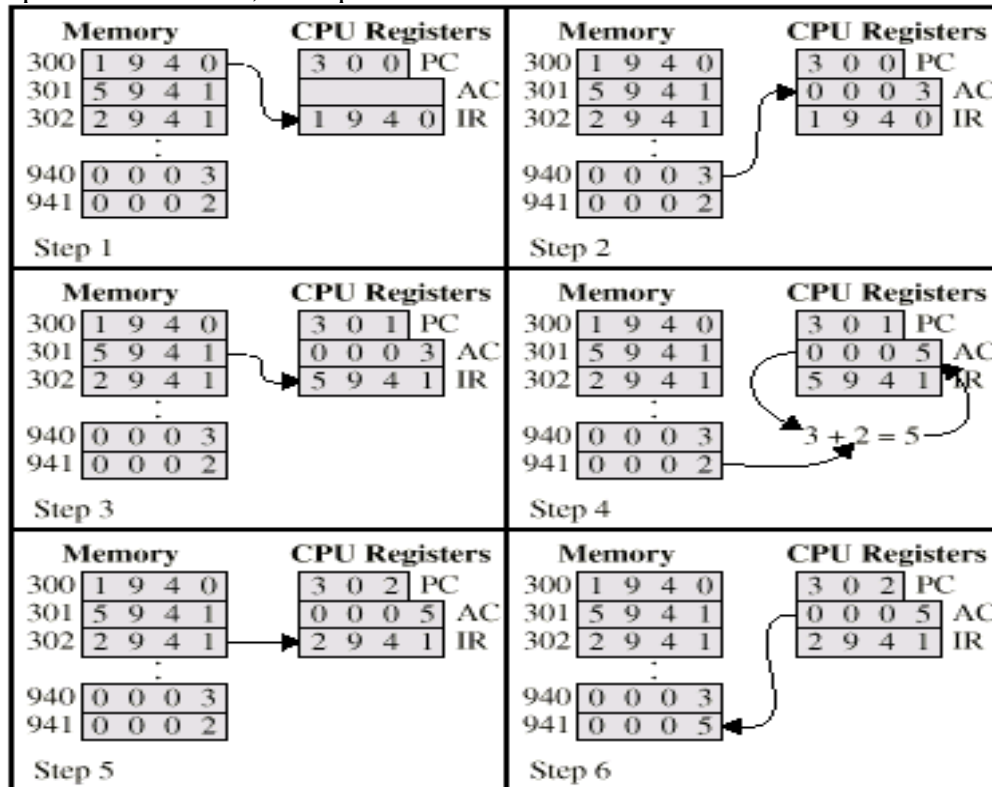


### Assignment 2

#### Question 1

For the following computer architecture fetch-execute cycles, assume opcode for Load is 1, opcode for add is 5, and opcode for store is 2



If the 3<sup>rd</sup> line in the program with content “2941” in all steps is changed to “5941”  
Explain how this would change register values in step 5 and step 6

In 3<sup>rd</sup> line the meaning of the command will be add number 2 in location 941 to accumulator, in step 5 it will be the same because it is fetch, in step 6, AC will contain  $5+2=7$

#### Question 2

Write down the micro steps for the following instructions

Load A

- » Move A into MAR
- » Send read signal to Memory
- » Move data from MDR to one of the micro processor registers

Add B,A

- » Move B to MAR
- » Send a read signal
- » Move B to the ALU input, send add bits to the ALU
- » Move output through accumulator to one of CPU registers

- » Move A to MAR
- » Send a read signal
- » Move A to the ALU input, send add bits to the ALU
- » Move output through accumulator to one of CPU registers

Write C

- » Move C into MAR
- » Send Write signal to Memory
- » Move data from MDR to the memory location C

Question 3

Define what is meant by a fetch cycle, and an Execute cycle, list specific operations that happened in it each and what type of data/instructions that happened in side it.

Question 4

Define what is meant by the following

1. Hard wired Computer Board
2. Micro coded Computer Board