

Answer: 1

1st Step

300: 5501	PC = 300
301: 2502	AC =
302: 4501	IR = 5501
501: 0004	
502: 0001	

2nd Step

300: 5501	PC = 301
301: 2502	AC = 0004
302: 4501	IR = 5501
501: 0004	
502: 0001	

3rd Step

300: 5501	PC = 301
301: 2502	AC = 0004
302: 4501	IR = 2502
501: 0004	
502: 0001	

4th Step

300: 5501	PC = 302
301: 2502	AC = 0003
302: 4501	IR = 2502
501: 0004	
502: 0001	

5th Step

300: 5501	PC = 302
301: 2502	AC = 0003
302: 4501	IR = 4501
501: 0004	
502: 0001	

6th Step

300: 5501	PC = 303
301: 2502	AC = 0003
302: 4501	IR = 4501
501: 0003	
502: 0001	

Bonus Question

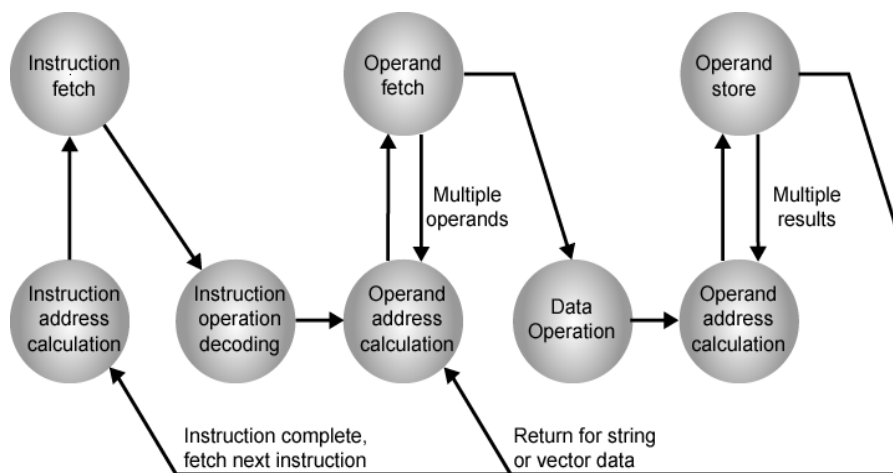
Assume that contents of memory location 940 is 3

1st step is:

300:3005	PC = 300
301:1940	AC =
302:7006	IR = 3005
940: 0003	

Rest of program execution is similar to the Question,1

Answer: 2



Instruction Fetch:

Read instruction from its memory location into the processor (IR)

Operand Fetch:

Fetch the operand from memory or read it in from I.O

Note

Due to ambiguity in question, I have accepted those answers as well who had made the basic instruction cycle with only Fetch and Execute boxes

Answer: 3

Write signal cannot be initiated until the valid data is on data lines. Otherwise, it will write rubbish data

Answer: 4

DMA: Direct Memory Access

PC: Program Counter