Quiz 1 20/2/2020

1: In the Hypothetical Machine the contents of memory was as shown. And PC contents is 300. Show the contents of memory and PC, AC, IR after execute three instructions (three fetch cycle and there execute cycle)

300 | 1940

301 | 5941

302 | 2941

:

940 | 0003

941 | 0002

Answer

step1

⦁ fetch

AC: 0000 0

IR: 1940

PC: 300

⦁ Execute

AC: 0003

IR: 1940

PC: 300

step2

⦁ Fetch

AC: 0003

IR: 5941

PC: 301

⦁ Execute

AC: 0005

IR: 5941

PC: 301

step 3

⦁ Fetch

AC: 0005

IR: 2941

PC: 302

⦁ Execute

Ac: 0000

IR: 2941

PC: 302

2: Show the contents of PC , AC and IR and memory after the execution of each instruction of the following program on the Hypothetical Machine:

300 LOAD 550

301 ADD 551

302 STORE 600

Where the contents of memory at 550 is 3 and at 551 is 4.

Answer

step1

⦁ Fetch

AC: 0000

IR: 1550

PC: 300

⦁ Execute

AC: 0003

IR: 1550

PC: 300

step2

⦁ Fetch

AC: 0003

IR: 5551

PC: 301

⦁ Execute

AC: 0007

IR: 5551

PC: 301

step3

⦁ Fetch

AC: 0007

IR: 2600

PC: 302

⦁ Execute

AC: 0000

IR: 2600

PC: 302

3: The following figure provide the main characteristics of Hypothetical Machine

0 3 4 15

|  |  |
| --- | --- |
| opcode | Address |

(a)instruction format

0 1 15

|  |  |
| --- | --- |
| s | magnitute |

(b) Integer format

Program counter (PC) = address of instruction

Instruction register (IR) = Instruction being executed

Accumulator (AC) = Temporary Storage

(c) Internal Cpu registers

0001= load ac from memory

0010= store ac to memory

0101= add to ac from memory

(D) partial list of opcodes

The hypothetical machine also has two I/O instructions:

0011 = load AC from I/O

0111 =store AC to I/O

In these case, the 12-bi address identifies a particular I/O device. Show the program execution for the following program:

1. Load AC from device 5.

2. Add contents of memory location 940.

3. Store AC to device 6.

Assume that the next value retrieved from device 5 is 3 and that location 940 contains a value of 2.

Answer

300 : 3005

301 : 5940

302 : 7006

device 5: 0003

940: 2

device 6: 0005