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Section : 7

<u>Quiz 1</u>   23/2/2020

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)

Memory

300	1	9	4	0
301	5	9	4	1
302	2	9	4	1
:				
940	0	0	0	3
941	0	0	0	2

Answer :

Load

Memory

300	1	9	4	0
301	5	9	4	1
302	2	9	4	1
:				
940	0	0	0	3
941	0	0	0	2

PC : 300

AC : 0003

IR : 1940

Add

Memory				
300	1	9	4	0
301	5	9	4	1
302	2	9	4	1
.				
940	0	0	0	3
941	0	0	0	2

PC : 301

AC : 0005

IR : 5941

Store

Memory				
300	1	9	4	0
301	5	9	4	1
302	2	9	4	1
.				
940	0	0	0	3
941	0	0	0	2

PC : 302

AC : 0000

IR : 2941
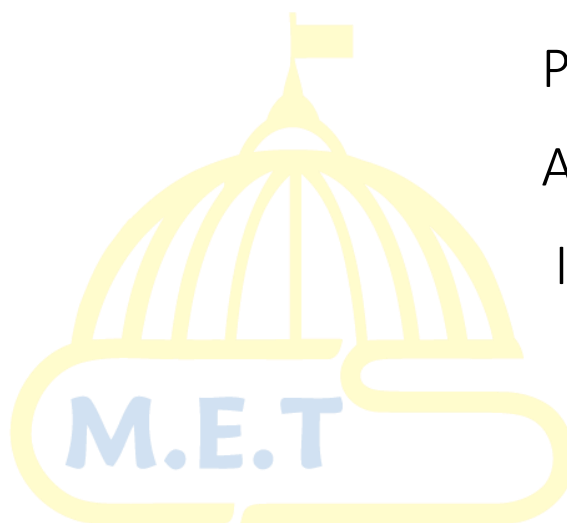
2-

✓ 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
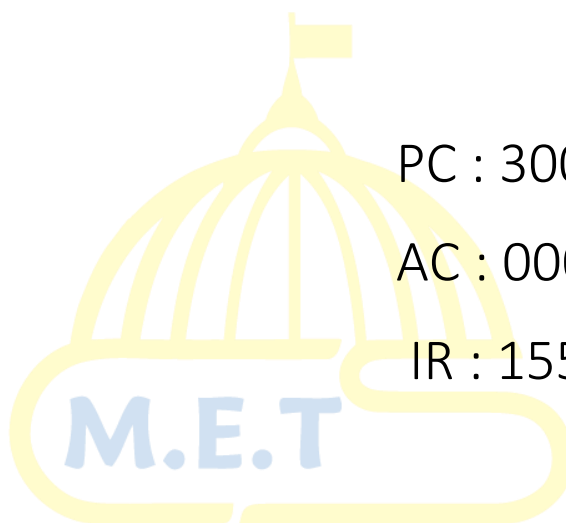
Answer :

Load

300 : 1550	PC : 300
301 : 5551	AC : 0003
302 : 2600	IR : 1550
550 : 0003	
551 : 0004	
600 : 0000	

Add

300 : 1550	PC : 301
301 : 5551	AC : 0007
302 : 2600	IR : 5551
550 : 0003	
551 : 0004	
600 : 0000	

Store

300 : 1550	PC : 302
301 : 5551	AC : 0000
302 : 2600	IR : 2600
550 : 0003	
551 : 0004	
600 : 0007	
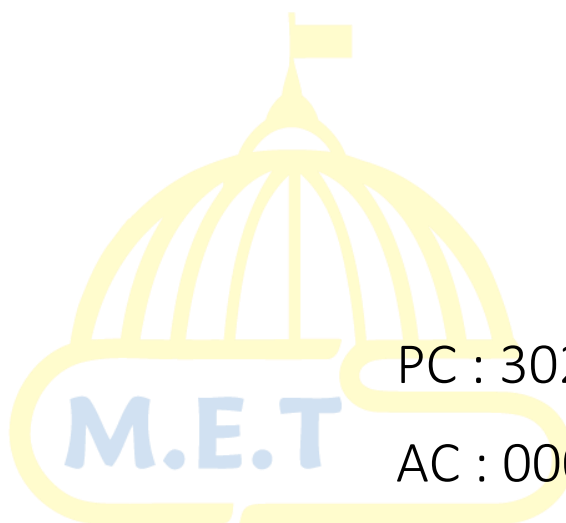
3- ✓

.The following figure provide the main characteristics of Hypothetical Machine ✓

0	3	4	15
Opcode		Address	

(a) Instruction format

0	1		15
S		Magnitude	
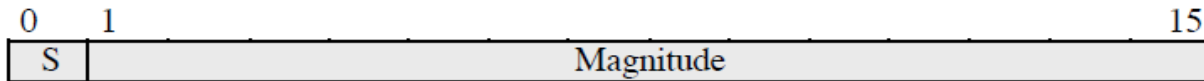
(b) Integer format

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.
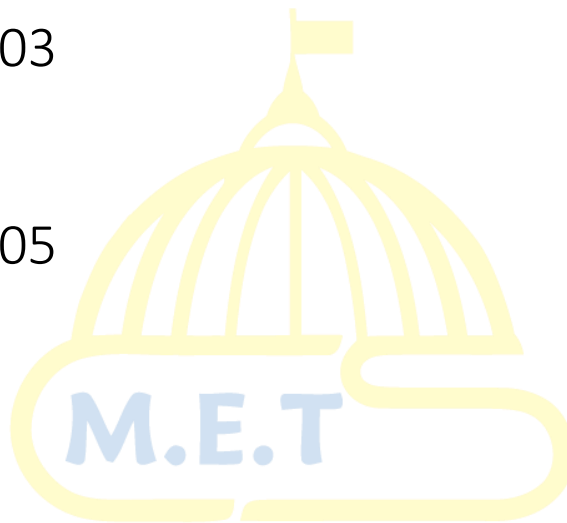
Answer :

300 : 3005

301 : 5940

302 : 7006

Device 5 : 0003

940 : 2

Device 6 : 0005