FYBSc

Information Technology

Practical Manual : Microprocessor Architecture

Practical No. 1

Aim : Perform the following Operations related to memory locations

a) Store the data byte 32H into memory location 2000H
b) Exchange the contents of memory locations 2000H and 3000H

Solution:

Practical No. 1 a) Store the data byte 32H into memory location 2000H

Algorithm :
Step 1: Get the number to store in accumulator
Step 2: Store the number in acumulator at intended memory location
Step 3: Halt

Address	Label	Mnemonic	Opcode	Remarks
2000		MVI A, 32h	3E	; Store 32H in the accumulator
2001			32	
2002		STA 2000h	32	;Store the contents of accumulator at memory location 3000h
2003			00	
2004			20	
2005		HLT	76	; Halt

Alternate method:

Algorithm :
Step 1: Initialize HL pair with memory location where you want to store the number
Stpe 2: Store the number at memory location specified by HL register pair.
Step 3: Halt

Address	Label	Mnemonic	Opcode	Remarks
2000		LXI H, 2000h	21	; Initialize the HL pair with memory location 3000H
2001			00	
2002			20	
2003		MVI M, 32h	36	; Store the number in memory location specified by HL register pair.

2004			32	
2005		HLT	76	Halt

Note: The result of both programs will be the same. In first method direct addressing instruction is used, whereas in program 2 indirect addressing instructions is used.

Result : The data byte 32h is stored at memory location 2000h.

Sub Practical 1.b : Aim: Exchange the contents of memory locations 2000H and 3000H

Algorithm :

Step 1: Initialize HL pair with memory location 2000h where a number is stored.
Step 2: Get the contents of memory location into register B.
Step 3: Initialize HL pair with memory location 3000h where a number is stored.
Step 4: Get the contents of memory location into register A i.e. Accumulator.
Step 5: Move the contents of Register B into memory.
Step 6: Store the contents of Accumulator into memory location 2000h

Address	Label	Mnemonic	Opcode	Remarks
2000		LXI H, 2000h	21	; Initialize the HL pair with memory location 2000H
2001			00	
2002			20	
2003		MOV B, M	46	; Store the number in memory location specified by HL register pair.
2004		LXI H, 3000h	21	; Initialize the HL pair with memory location 3000H
2005			00	
2006			30	
2007		MOV A, M	7E	; Move the contents from memory to accumulator
2008		STA 3000h	32	; Store the contents of accumulator into memory location 3000h
2009			00	
200A			30	
200B		HLT	76	Halt

Alternate method

Algorithm :

Step 1: Load directly the contents of memory location 2000h into accumulator.
Step 2: Copy the contents of accumulator into Register B.
Step 3: Load directly the contents of memory location 3000h into accumulator.
Step 4: Store the contents of accumulator into memory location 2000h
Step 5: Move the contents of Register B into memory.
Step 6: Store the contents of Accumulator into memory location 3000h

Address	Label	Mnemonic	Opcode	Remarks
2000		LXI H, 2000h	21	; Initialize the HL pair with memory location 2000H
2001			00	
2002			20	
2003		MOV B, M	46	; Store the number in memory location specified by HL register pair.
2004		LXI H, 3000h	21	; Initialize the HL pair with memory location 3000H
2005			00	

2006			30	
2007		MOV A, M	7E	; Move the contents from memory to accumulator
2008		STA 3000h	32	; Store the contents of accumulator into memory location 3000h
2009			00	
200A			30	
200B		HLT	76	Halt

Result : Contents of given memory location are exchanged.