



## LAB REPORT COVER PAGE

Lab No: .....03.....

Student ID: .....23081055.....

Student Name: .....Sudip..Bhomjaya.....

Initial Submission Date: .....18..Aug..2023.....

Final Submission Date: .....

Course Name: Microprocessor

Course Code: CSC167

Semester: 2<sup>nd</sup>

Instructor/Examiner/Lecture: Bhuwan Acharya

Evaluator's Comment:

Evaluator's Signature: .....

## LAB 3:- Familiarization with LDA, STA, STAX, MOV, LDAX, XCHG

### Objectives:

- To demonstrate the basic understanding of data transfer instructions using the 8085 microprocessor simulator.
- To Load and store the data into the register, copy data from register to memory locations etc.
- To perform data exchange between two pair of registers.

### Introduction:

The data transfer instructions load given data into register, copy data from register to register, copy data from register to memory location and viceversa. These instructions do not affect the flag register of the processor.

The data transfer instruction includes LDA, STA, STAX, LDAX, MOV, XCHG etc.

#### 1. LDA (Load Accumulator direct):-

- LDA is a 3 byte instruction that loads the accumulator with the contents of memory location whose address is specified by 16 bit address.

Eg: LDA 4020H

$A \leftarrow [4020H]$

#### 2. LDAX Rp (Load accumulator indirect):-

- It is a 1-byte instruction that loads the contents of memory location pointed by the contents of register pair to accumulator.

Eg: LDAX B      LXIB, 9000H      B = 90, C = 00

LDAX B      A = [9000]



3. STA (store accumulator content direct) :-

→ It is 3-byte instruction that stores the contents of accumulator to specified address.

Eg: STA FA00H

4. STAX Rp :-

→ It stores the contents of accumulator to memory location specified by contents of register pair.

Eg: STAX AB

(Data is stored in B (pair of accumulator))

5. XCHG (Exchange)

Exchanges DE pair with HL pair.

Q. NO. 1

Evaluate the contents of register and memory.

Instruction	Description
LXI B, 9900H	Loads immediate data to BC register pair. i.e $B \leftarrow 99, C \leftarrow 00$
LXI D, 9901H	Loads immediate data to DE register pair i.e $D \leftarrow 99, E \leftarrow 01H$
MVI A, 32H	loads 32H to the specified accumulator
STAX B	stores the contents of accumulator to memory location specified by the contents of B-C pair
MVI A, 7AH	loads data 7AH to accumulator
STAX D	stores the contents of accumulator to memory location specified by the contents of D-E pair
HLT	

memory view

	0	1	2	...
990	32	7A		
991				
⋮				

Assembler output

01 00 99	LXI B, 9900H
11 01 99	LXI D, 9901H
3E 32	MVI A, 32H
02	STAX B
3E 7A	MVI A, 7AH
12	STAX D
76	HLT

Q. NO. 2

Load 16-bit number from memory 3300H into a register pair (H-L). Exchange the register pairs. Loads a 16-bit memory 3302H into a register pair (DE). Exchange both the register pairs.

Instruction	Description
LHLD 3300H	Loads the contents of 3300 to L register and contents of 3301H to H register.
MOV D, H	copies data from H register to D register
MOV E, L	copies data from L to E register
LHLD 3302H	Loads contents of 3302 to L register and contents of 3303 to H-register
XCHG	Exchanges DE pair with HL pair
HLT	

Output:  
memory view

	0	1	2	3	...
330	42	7A	07	AB	
331					
:					

Register:

A/PSW	0X	00	02
BC	0X	00	00
DE	0X	7A	42
HL	0X	AB	07
SP	0X	FF	FF
PC	0X	08	08

Assembly output

2A 00 33	LHLD 3300H
54	MOV D, H
5D	MOV E, L
2A 02 33	LHLD 3302H
EB	XCHG
76	HLT



Q. no. 3

load 16-bit number from memory 3300 into register pair (H-L). Load a 16 bit memory 3302 into a register pair (DE). Exchange both the register pairs.

Instruction	Description
LHLD 3300H XCHG	Loads the contents of 3300 to L register and contents of 3301H to H register Exchanges DE pair with HL pair
LHLD 3302H XCHG HLT	Loads the content of 3302 to L register and contents of 3302 to H pair Exchanges DE pair with HL pair

Output  
memory view

	0	1	2	3
330	07	A5	77	4E...
331				
:				

Register

ALPSW	0X 00 02
BC	0X 00 00
DE	0X A5 07
HL	0X 4E 77
SP	0X EF FF
PC	0X 68 07

Assembler output	
2A 00 33	LHLD 3300H
EB	XCHG
2A 02 33	LHLD 3302H
EB	XCHG
76	HLT

Conclusion:

From these lab exercises we have basic understanding of data transfer instructions. We also learned to load, store and exchange data in register as per users requirements.