I N D E X

Sr. No.	Experiment Description	Page No. ~~Experiment Date~~	Submission Date	Remarks/Signatures
1.	Demonstration and study of 8085 microprocessor kit.	1 to 6		
2.(a)	Program for addition of two hexadecimal numbers.	7 to 8		
(b)	Program for subtraction of two hexadecimal number.	9 to 11		
3.(a)	Program for finding largest number from an array	12 to 14		
(b)	Program for finding smallest number from an array	15 to 17		

INDEX

Sr. No.	Experiment Description	Page Experiment Date	Submission Date	Remarks/Signatures
4.	Program for arranging numbers in ascending / decending order.	18 to 21		
5.	Program for 16-bit addition.	22 to 25		

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Date :
Page 01
Topic : Experiment - 1

OBJECTIVE:- To study 8085 based microprocessor system.

APPARATUS REQUIRED:-
- 8085 microprocessor kit

THEORY:-
The Intel 8085 is an 8-bit microprocessor produced by Intel and introduced in 1976. It is a software-binary compatible with the most famous Intel 8080 with only two minor instructions added to support its added interrupt and serial input/output features.

It consists of five essential blocks.
i. Arithmetic logic section
ii. Register section
iii. The interrupt control system
iv. Serial I/O section.
v. The timing and control unit

1. General purpose register.
→ It is an 8-bit register i.e B, C, D, E, H, L. The combination of 8-bit register is known as register pair.

2. Accumulator
→ It is an 8-bit register which hold one of the data to be processed by ALU and stored the result of the operation.

3. Program Counter (PC)
→ It is 16-bit pointer which eliminate the maintain address of a byte entered to the stack.

4. Stack Pointer (SP):
→ It is a 16-bit special purpose register which uses to hold the memory address for the next instruction to be executed.

5. Arithmetic and logical unit.
→ It carries out arithmetic and logical operation by 8-bit address it uses the accumulator content as input the ALU result is blocked stored in accumulator.

6. Temporary Register
→ It is an 8 bit register associated with ALU hold data, entering an operation, by the microprocessor and not accessible to programs.

7. Flags:
→ Flag register is a group of five individual flip flops like content of the flags register will change after execution of arithmetic and logic operation.
(a) C flag (b) zero flag (c) S flag (d) P flag (e) AC flag

8. Timing and control Unit.
→ Synchronous all microprocessor, operation with the help of clock and generator and control unit from it necessary to communicate between controller & peripherals.

9. Instruction register and decoder:
→ Instruction is fetched from the ~~memory~~ memory and stored in the instruction register decoder the stored information.

10. Register Array
→ There are used to store 8-bit data during execution of some instruction.

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Date:

Page: 04

Topic: Experiment -1

PIN DESCRIPTION.

→ Address Bus
pin A0-A15

→ Address / Data Bus
pin AD0-AD7

→ ALE (Address latch enable)

→ IO/M

→ S0-S1

→ RD

→ WR

→ HOLD

→ HLDA

→ INTR

→ INTA

→ RST 5.5, 5.6, 7.5

Topic: Experiment - 1

→ TRAP

→ RESET IN

→ X1, X2

→ SID

→ SOD

→ Vcc and Vss.

In Enter Program into Trainer Kit :-

i. Press 'RESET' key.
ii. Subs (key processor reference address field)
iii. Enter address (16-bit) and digit in hex.
iv. Press 'NEXT' key
v. Enter the data
vi. Align press "NEXT"
vii. Again after taking the program, are the HLT instruction its Hex code.
viii. Press 'NEXT'

Page 06

Experiment - 1

How to execute program:-

1. Press "RESET"
2. Press "GO"
3. Give the address location in which the program was executed
4. Press "Execute" key.

RESULT:-

Thus 8085 microprocessor was studied successfully.

PRECAUTIONS:-

(i) Connection should be proper & right
(ii) Switch "ON" the power after completing the circuit.

Date

Page 07.

Topic: Experiment – 2 (a)

OBJECTIVE:-

Write a program to add two hexadecimal Number.

APAARATUS REQUIRED:-

Sr. No.	Name	Version	Quantity
1.	8085 microprocessor programming kit, instruction coding sheet	SCIENTECH-8085	1.
2.	Power Supply	A.C (230V Main)	

DESCRIPTION / ALGORITHM:-

(Hexadecimal Addition):

→ The program takes the content of 2009, adds it to 200B & stores the result back at 200C.

Steps.

1. Initialize the HL Reg. pair with address where the first Number is lying.
2. Store the Number in accumulator.
3. Get the second number
4. Add the two numbers and store the result in 200B.
5. Go back to monitor

Date

Page 08

Topic Experiment - 2(a)

Let :

(2009 H) = 80 H

(200B H) = 15 H

Result = 80H + 15H = 95H

(2009 H) → A

A → B

(200B H) → A

A + B → A

A → (200C H)

PROGRAM :-

LXI H, 2009 : Point 1st No.

MOV A, M : Load the acc.

INX H : Adv. pointer

ADD M : Add 2nd No.

INX H : Adv. pointer

MOV M, A : Store result

RST 5

RESULTS :-

Thus the numbers at 2009 H and at memory are added.

CONCLUSION :-

Thus the program to add 8-bit two numbers was executed.

Date
Page 09
Tags Experiment - 2 (b)

OBJECTIVE :-

Write a program to subtract two hexadecimal number.

APPARATUS REQUIRED :-

Sr. No.	Name	Version	Quantity.
1	8085 microprocessor programming kit instruction coding set	SCIENTECH 8085	1
2.	Power Supply	AC (230V)	

DESCRIPTION / ALGORITHM :-

(Hexadecimal Subtraction).

→ The program takes the content of 2009, subtracts it to 200B & stores the result back at 200C.

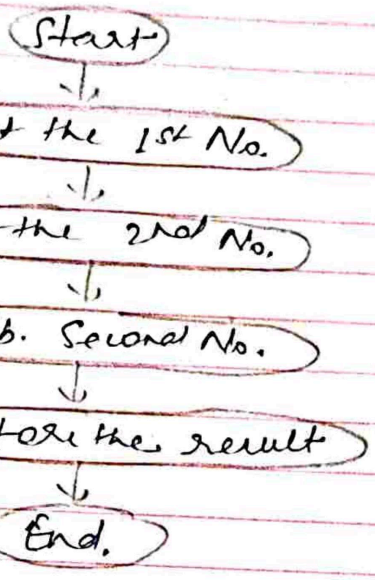
Steps :

1. Initialize HL Reg. pair with address where the first number is lying.
2. Store the number in accumulator
3. Get the second Number
4. Subtract the second no. from acc. and store the result in 200B.
5. Go back to Monitor.

Date

Topic Experiment 2(b) Page 10

FLOWCHART:-



PROGRAM:-

```
LXI H, 2009  :  Point 1st No.
MOV A, M     :  Load the acc.
INX H        :  Adv pointer
SUB M        :  Subtract 2nd No.
INX H        :  Adv. pointer
MOV M, A     :  Store result
RST 5        :
```

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Date :

Page : 11

Topic : Experiment - 2(b)

RESULTS :-

Numbers at 2009H and in HL pairs (Memory) are subtracted.

CONCLUSION :-

Thus the subtraction operation is taken out using assembly language.

Date

Topic Experiment - 3 (a)

OBJECTIVE:-

Finding the largest number from an array.

APPARATUS REQUIRED:-

Sr. No.	Name of components	Version	Quantity
1.	8085 microprocessor programming kit, instruction coding sheet.	SCIENTECH 8085	1.
2.	Power supply.	AC(230V)	

DESCRIPTION / ALGORITHM:-

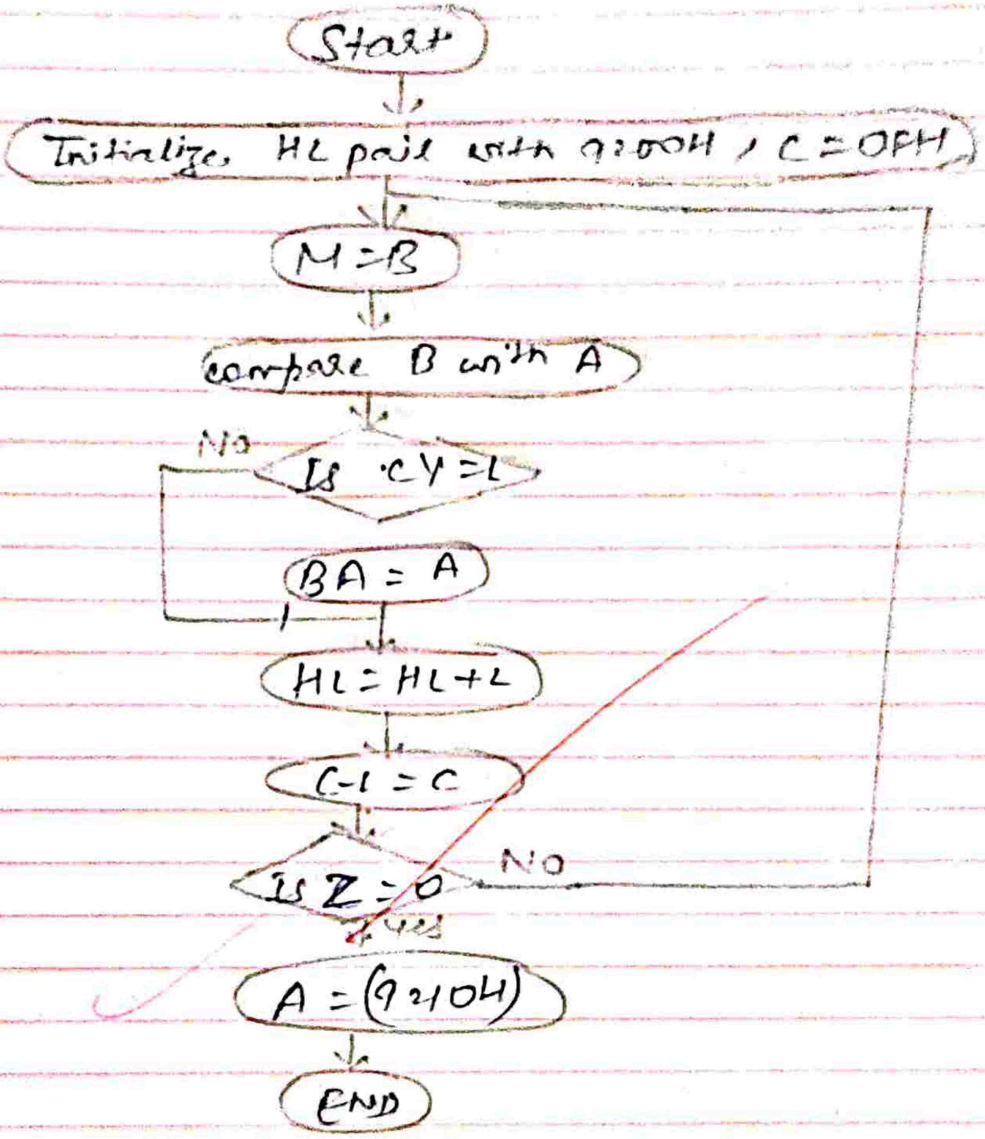
→ Write a program to find the largest number in given array of 16 elements.

→ The array is stored in memory from 9200H onwards.

→ Store the largest at the end of the array.

Experiment - 9(a)

FLOWCHART:-



Experiment - 3(a)

PROCEDURE:-

To find largest of given no. of a given string we compare all given no. one by one.
Suppose given no. is 2, 1, 3, 4, 0.
1st we compare 2 & 4 (2 is in register A and 4 is in register B)

A < B so put B into (A) & compare with next number i.e 3.
Here, A > B so directly compare 4 with 4 then 0.

RESULT & PREFERENCE:-

The largest Number from the array of 16 number from memory location 9200H is found out and stored in 9210H.

PRECAUTIONS-
Take memory locations according model told.

Date Page 15

Topic Experiment - 3(b)

AIM:- finding the smallest number from an array.

"Write a program to find smallest number from an array of 16 elements the array is stored in memory from 9200H onwards Store the result at memory location 9210H.".

REQUIREMENT:-

- 8085 microprocessor programming kit,
- Instruction coding sheet.

THEORY:- Same as Largest no. we compare two number one by one but comparison process is reverse.

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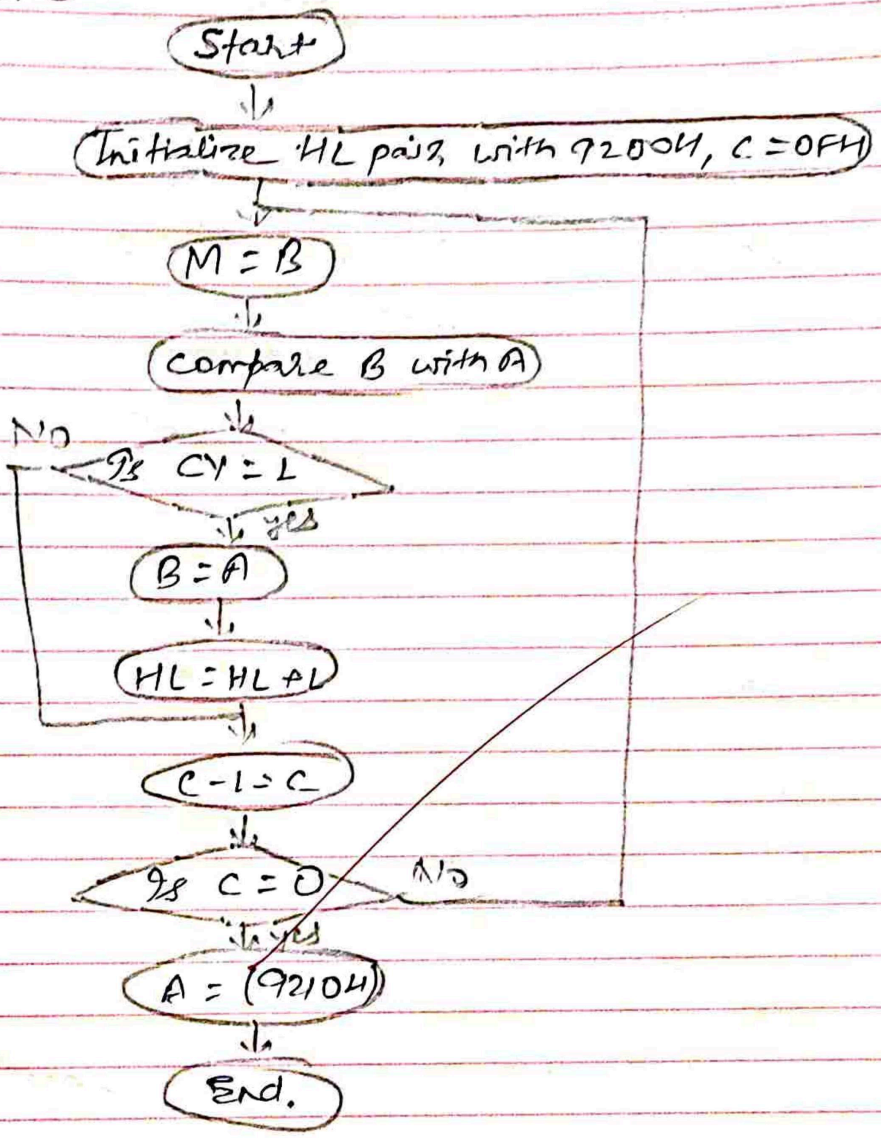
Date : Page : 16

Topic : Experiment - 2(b)

PROCEDURE:-



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Date :

Page : 12

Topic : Experiment - 3(b)

RESULTS:-

Smallest Number has been found out from a 16-bit array starting from 9200H and is stored at 9210H.

CONCLUSIONS-

Thus the smallest number has been found out from the array in assembly language for 8085 microprocessor.

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Date : Page : 18

Topic : Experiment - 8.

AIM:-

Write an ALP to arrange set of 8-bit numbers starting at location in ASCENDING / DESCENDING order.

Display the stored vector in address field.

PROGRAM:-

```
START:   MVI B,(N-1)
         MVI C, (N-1)

NEXTPASS: LXI H, FLOC

LOOP:    MOV A, M

         INX H

         CMP M

         JC NOSWAP

SWAP:    MOV D, M

         MOV M, A
```

```
        DCX H
        MOV M,D
        INX H
NOSWAP: DRC C
        JNZ LOOP
        DCR B
        MOV C, B
        JNZ NXTPASS
DESPLAY: LXI H, F100
        MVI C, N
NEXT:   MOV A, M
        STA FFFL
        PUSH H
```

```
        PUSH B
        CALL UPDDT
        CALL DELAY
        POP B
        POP H
        INX H
        DCR C
        JNZ NEXT
        HLT
DELAY:  LXI B, F424
WAIT :  DCX B
        MOV A, C
        ORA, B
        JNZ WAIT
        RET.
```

Date Page 24

Topic: Experiment - 4.

RESULT SHEET:-

N = 07.

AFTER EXECUTION:-

Src. Addr.	Data
F100	30
F101	12
F102	A3
F103	06
F104	46
F105	71
F106	23

Data field
01
12
23
30
46
71
A3

Note: "for descending order"
- change JC to JNC.

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Date

Page 22

Topic: Experiment - 5

AIM:- To write an assembly language program for adding two 16-bit numbers using 8085 microprocessor.

APPARATUS REQUIRED:-
8085 microprocessor kit (0-5V) DC battery.

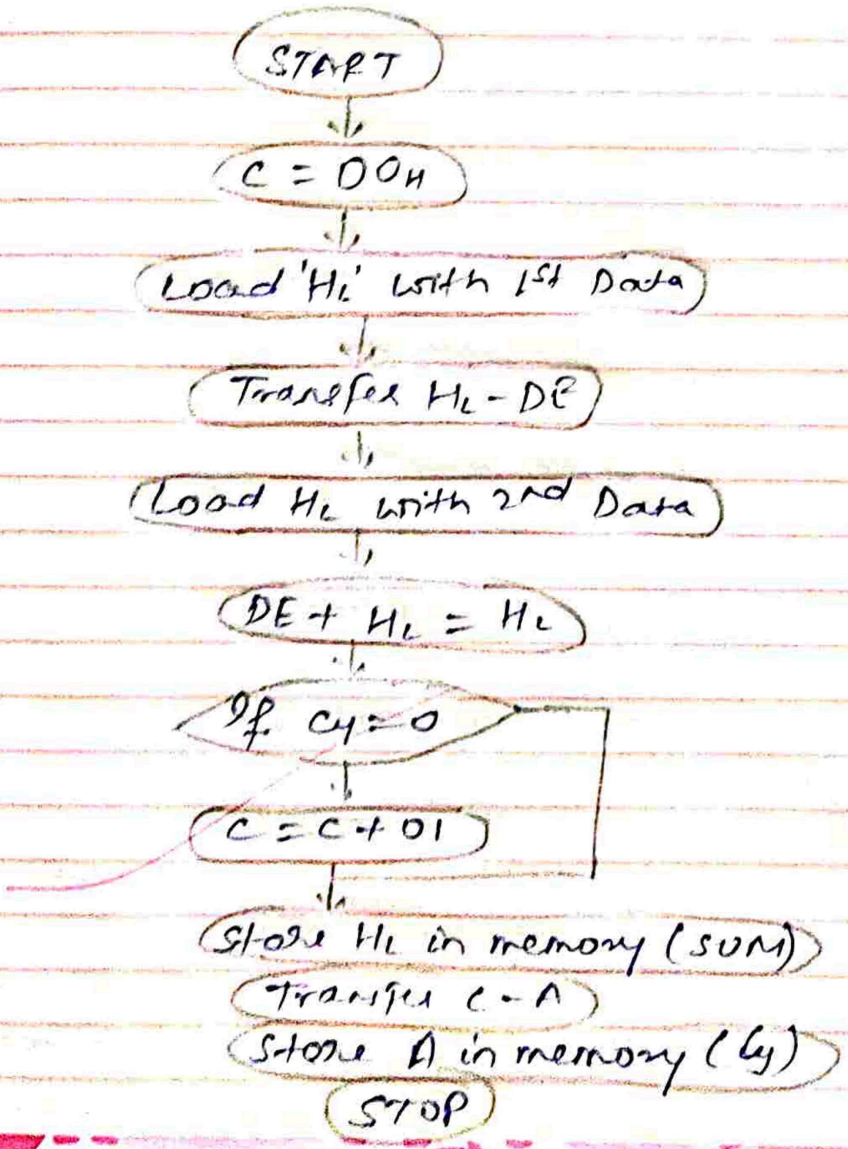
ALGORITHM:-
Step 1: Start the microprocessor
Step 2: Get the 1st 8 bit in 'C' register (LSB) and 2nd 8 bit in 'H' register (MSB) of 16-Bit Number.
Step 3: Save the 1st 16 bit in 'DE' register.
Step 4: Similarly get the 2nd 16 Bit number and store it in 'HL' register pair.
Step 5: Get the lower byte of 1st no. into 'L' register.
Step 6: Add it with lower byte of 2nd number.
Step 7: Store the result in 'L' register
Step 8: Get the higher byte of 1st number into the accumulator
Step 9: Add it with higher byte of 2nd number and carry of the lower bit addition.

Date

Topic Experiment -5

Step 10: Store the second in 'H' register
Step 11: Store 16 bit addition value in 'HL' register pair.
Step 12: Stop program execution.

FLOW CHART:



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Date :

Topic : Experiment - 5

PROGRAM :-

Address	Label	Mnemonics		Hexcode
4500		MVI	C, 00	0E
4501				00
4502		LHLD	4800	2A
4503				00
4504				48
4505		XCHG		EB
4506		LHLD	4802	2A
4507				02
4508				48
4509		DAD	D	19
450A		JNC	Ahead	D2
450B		JNC	450E	0E
450C				45
450D		INR	C	0C
450E	AHEAD	SHLD	4804	22
450F				04
4510				48
4511		MOV	C, A	79
4512		STA	4806	32
4513				06
4514				48
4515		HLT		76

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Date :

Page : 25

Topic : Experiment - 5

CALCULATION :-

0000	0100	0000	0001
0000	0011	0000	0010
0000	0011	0000	0011
0	7	0	3

RESULT :-

The assembly language program for addition of two 16-Bit numbers was executed using 8085 microprocessing kit