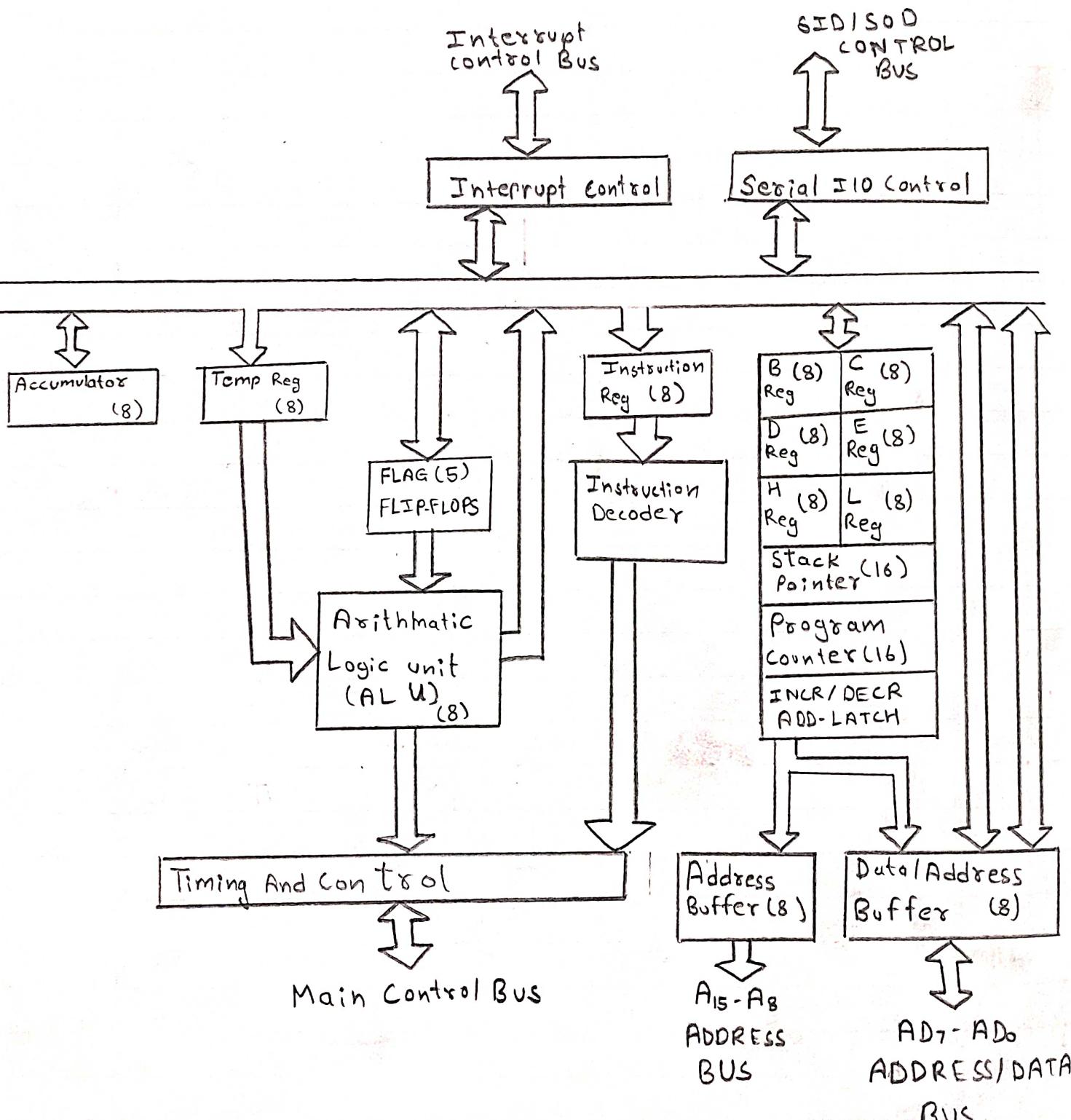


INDEX

PARTICULARS OF THE EXPERIMENTS PERFORMED

Expt. No.	Name of Experiment	Page No.	Date of Experiment	Date of Submission	Remarks
1]	To study microprocessor 8085		4/7/23	4/7/23	(Qn) 1/2
2]	Write program to do addition of two 8-bit numbers		11/7/23	20/8/23	(Qn) 1/2
3]	Write program to multiply two one byte hex numbers		20/8/23	28/8/23	(Qn) 1/2
4]	Write program to subtract two one byte hex numbers		28/8/23	10/9/23	(Qn) 1/2
5]	Write a program to divide two one byte hex numbers		10/9/23	15/10/23	(Qn) 1/2
6]	A block of data, find the largest and smallest number using linear search		15/10/23	26/11/23	(Qn) 1/2
7]	Write a program to exchange contents of two blocks of data		26/11/23	6/11/24	(Qn) 1/2
8]	Find first occurrence of a number in a block of data.		6/11/24	11/11/24	(Qn) 1/2
9]	Write a program to find how many times data A DH appears in memory block starting from 2030 H and length		11/11/24	11/11/24	(Qn) 1/2



INTERNAL BLOCK DIAGRAM
OF 8085

Practical 1

Aim :- To study microprocessor 8085.

Theory :- 8085 microprocessor - Functional units -

Accumulator :- it is an 8-bit register used to perform arithmetic logical, I/O and LOAD/STORE operation

Arithmetic and logical unit :- it performs arithmetic and logical operation like addition, subtraction, AND, etc on 8-bit.

General purpose register : There are 6 general purpose registers in 8085 processor, i.e B, C, D, E, H and L. Each register can hold 8-bit data.

Program counter - It is a 16-bit register used to store memory address location of the next instruction to be executed. The program counter points to the memory address of next instruction that is going to be executed.

Stack pointer : It is a 16-bit register work like stack, which is always incremented by 2 during push and pop operation.

Flag register : It is a 8-bit register having five 1-bit flip flops, which holds either 0 or 1 depending upon the result stored in accumulator.

These are the five flip flops -

- Sign (S)
- Auxiliary carry (AC)
- Carry (C)
- Zero (Z)
- Parity (P)

Timing and control unit signal to microprocessor to perform operation. Following are timing and control signals:

- Control signals : READY, RD', WR', ALE

- Status signals : SO, S1, I/O/M
- DMA signals : HOLD, HLDA
- Reset signals : RESET /M , RESET DOT

Address Buffer and address data buffer:

The content stored in stack pointer and program counter is loaded into the address buffer and address - data buffer to communicate with the CPU. The memory and I/O chips are connected to these buses.

Address bus and data bus

Data bus carries the data to be stored. It is bidirectional, whereas address bus carries the data to where it should be stored. It is used to transfer data and address I/O devices.

On AP

Practical 2

Ques:- Write a program to do addition of two 8-bit numbers. The two numbers are stored in 2030H and 2031H. Store result in 2032H.

Code :-	Address	LABEL	OPCODE	Operand	Hexcode	Comment
	2000	START	LXI	H, 2030	21	initialise HL as a memory pointer
	2001				30	lower address byte
	2002				20	higher address byte
	2003		MOV	A, M	7E	move the first no
	2004		INX	H	20	in a register
	2004		INX	H	23	increment HL, pointer by 1
	2005		ADD	M	86	Add accumulator data with HL pointer data
	2006		STA	2030	32	Store result in memory location.
	2007				32	lower address byte
	2008				20	upper address byte
	2009	STOP	RST	1	CF	Stop program execution

Before execution :

Memory location	Data
2030	06
2031	05
2032	00

After execution :

Memory location	Data
2030	06
2031	05
2032	0b

Result:- Two 8-bit numbers on 8085 performed. Thus we have addition of microprocessor kit.

Q3
Ans

Before execution

Memory location	Data
2030	02
2031	03
2032	06
2033	00

After execution

Memory location	Data
2030	02
2031	03
2032	06
2033	00

Practical 3

Aim:- write a program to multiply two one byte hex numbers stored in consecutive memory location starting from 2030. Store the two byte result in consecutive memory location starting from 2032 beginning with lower order byte.

Code	Address	label	OPCODE	OPERAND	Hexval	Comment
	2000	START	XRA	A	AF	EX OR with accumulator
	2001		MOV	B,A	47	move result of A to B register
	2002		LXI	H,2030	21	memory pointer
	2003				30	lower address byte
	2004				20	upper address byte
	2005		MOV	C,M	4E	Move data of M to C register
	2006		INX	H	23	Increment HL
	2007	LOOP	ADD	M	86	Add M to accumulator
	2008		JNC	200C	D2	Jump if no carry to address 200C
	2009				0C	lower address
	200A				20	upper address
	200B		INR	B	04	Increment B by 1
	200C		DCR	C	0D	Decrement C by 1
	200D		LNZ	2007	C2	Jump if no carry to address 200C
	200E				07	lower address byte
	200F				20	upper address byte
	2010		INX	H	23	Increment HL pointer
	2011		MOV	M,A	77	move result of L accumulator to M
	2012		INX	H	23	Increment HL pointer
	2014	STOP	RST 1		CF	stop program execution

Result:- Thus we have studied multiplication of two numbers of 8085 Kit.

On
28/8/23

Practical 4

sim:-

write a program for subtraction of two 8-bit numbers stored in memory location 2030 H and 2031 H. store the absolute difference in memory location 2032 H.

Code:-

Address	LABEL	OP CODE	OPERAND	HEX CODE	Comments
2000	START	LXI	H, 2030	21 30	memory pointer
2001				20	lower address byte
2002				20	upper address byte
2003		MOV	B, M	46	move data from M to accumulator
2004		INX	H	23	Increment HL by 1
2007		JP	200 DH	F2	Jump if +ve result to address 200 DH
2008				0D	
2009				20	
200A		CMA		2F	is complement of data in A
200D		INX	H	23	increment HL by 1
200E		MOV	M, A	77	move data of accumulator to M
200F	STOP	RST 1		C F	stop program execution

Before execution

Memory location	Data	Memory location	Data
2030	06	2030	06
2031	0A	2031	0A
2032	00	2032	04

Result:-

Thus we have performed subtraction of two 8-bit numbers on 8085-Kit

0 10
100

Practical 5

Ques:- Write a program that divides two one byte hex number where the divisor is stored in 2031H and dividend is stored in 2030H. Store the quotient and remainder in next consecutive memory location.

Code :-	ADDRESS	LABEL	OPCODE	OPERAND	HEX CODE	COMMENT
	2000	START	XRA	A	AF	ExOR A with A
	2001		MOV	B, A	47	Move data of accumulator in register B
	2002		LXI	H, 2030	21	Initialize HL pair as memory pointer
	2003				30	Lower address byte
	2004				20	Upper address byte
	2005		MOV	A, M	7E	Move data from M to C registers
	2006		INX	H	23	Increment HL by 1
	2007		CMP	M	B E	Compare data of M with accumulator
	2008		JC	2010	DA	Jump if carry is generated to 2010H
	2009				10	lower address byte
	200A				20	Upper address byte
	200B				23	Increment HL by 1
	2011		INX	H	23	Move data of B register to M
	2012		MOV	M, B	20	Increment HL by 1
	2013		MOV	H	23	Move data of accumulator to M
	2014	STOP	RST 1	M, A	77	Stop program execution

Before execution :-

Memory location	Data
2030	06
2031	02
2032	00
2033	00

After Execution :-

Memory location	Data
2030	06
2031	02
2032	03
2033	00

Result:- Hence we have studied division of two numbers in 8085 kit.

Q110

Practical 6

dim :- A block of data is stored in memory locations from 2030H to 2036H. find the smallest as well as greatest number from this block using linear search. Store result immediately after the end of the block.

code :-

Address	Label	OPCODE	OPERAND	HEX CODE	Comment
2000	START	MVI	407H	0E	Move data of H to register C
2001				07	
2002		LXI	H, 2030	21	Initialize HL pair to memory location
2003				30	Lower address byte
2004				20	Upper address byte
2005		MOV	D, M	56	Move the data of M to register D
2006		MOV	E, M	5E	Move the data of M to register E
2007		DCR	C	0D	Decrement C by 1
2008		INX	H	23	Increment HL by 1
2009		MOV	A, M	7E	Move data of M to accumulator
200A		CMP	D	BA	Compare data of D with accumulator
200B		JC	200FH	DA	Jump if carry is generated to register D
200C				OF	Compare data of E with accumulator
200D				20	Jump if no carry is generated to 20M
200E		MOV	D, A	57	Move data of accumulator to register D
200F		CMP	E	BB	Compare data of E with accumulator
2010		JNC	2014H	D2	Jump if no carry is generated to 201H
2011				14	Lower address byte
2012				20	Upper address byte
2013		MOV	E, A	5F	Move data of accumulator to reg E
2014		DCR	C	0D	Decrement C by 1
2015		JNZ	200BH	C2	Jump if no zero is generated to 200BH
2016				08	Lower address byte
2017				20	Upper address byte

ADDRESS	LABEL	OPCODE	OPERAND	HEXCODE	COMMENT
2018		INX	H	23	Increment HL by 1
2019		MOV	H,D	72	Move data of D to H
201A		INX	H	23	Increment HL by 1
201B		MOV	M,E	73	Move data of E into M
201C	STOP	RST1		C0	stop program execution

Before execution:-

Memory location	Data
2030	04
2031	07
2032	05
2033	09
2034	02
2035	01
2036	08
2037	00
2038	00

After execution :-

Memory location	Data
2030	04
2031	07
2032	05
2033	09
2034	02
2035	01
2036	08
2037	09
2038	01

Result:- Hence we have found smallest and greatest number among the work of data using linear search in 8085 kit.

O₂d11

Practical 7

Aim :-

A block of data is stored in memory location from 2060H to 206A H. Another block of data having same length is stored in memory location starting from 100H. Write a program to exchange content of two blocks.

Schedule :-

ADDRESS	LABEL	OPCODE	OPERAND	HEX CODE	COMMENTS
2000	START	M VI	C, 0B, H	0E	Move data of 0B H to C register
2001				OB	
2002		LXI	H, 2060H	21	Initialize HL pair to mem loc 2060H
2003				60	lower address byte
2004				20	Upper address byte
2005		LXI	D, 2100H	11	Initialize DE pair to mem loc 2100H
2006				00	lower address byte
2007				21	Upper address byte
2008		LDAX	D	1A	stored in DE Pair
2009		MOV	B, M	96	move the content of M to reg B
200A		MOV	M, A	77	Move the content of accumulator to M
200B		MOV	A, B	78	Move data of accumulator in DE pair
200C		STAX	D	12	DE pair
200D		INX	H	23	Increment HL pair by 1
2012				20	Upper address byte
2013	STOP	RSTI		CF	Stop program execution.

01/11/24
6/11/24

Before execution

Memory location	Data	Memory location	Data
2060	01	2100	31
2061	02	2101	32
2062	03	2102	33
2063	04	2103	34
2064	05	2104	35
2065	06	2105	36
2066	07	2106	37
2067	08	2107	38
2068	09	2108	39
2069	10	2109	40
206A	11	210A	41

After execution

Memory location	Data	Memory location	Data
2060	31	2100	01
2061	32	2101	02
2062	33	2102	03
2063	34	2103	04
2064	35	2104	05
2065	36	2105	06
2066	37	2106	07
2067	38	2107	08
2068	39	2108	09
2069	40	2109	10
206A	41	210A	11

Result:- Thus we have performed a program to exchange content of two bytes.

Q6118

Practical 8

Aim:-

Write a program to find first occurrence of ABH data.
The length of block is stored in 207F H. The data is stored from memory location 2080H. Store the address of occurrence in HL pair. if data is not found store FFFFH in HL pair.

Code :-	ADDRESS	LABEL	OP CODE	OPERAND	HEX CODE	COMMENT
2000	START	LXI		H, 207F H	21	Initialise HL pair to loc 207FH
2001					7F	Lower address byte
2002					20	Upper address byte
2003		MOV		C, M	4E	Move content of M to C reg
2004		MVI		A, ABH	3E	Store AB into accumulator
2005					AB	data
2006		INX		H	23	Increment HL pair by 1
2007		CMP		M	BE	Compare M with accumulator
2008		JZ		2012H	CA	Jump if zero generated to 2012H
2009					12	Lower address byte
200A					20	Upper address byte
200B		DCR		C	0D	Decrement reg C by 1
200C		JNZ		2006H	C2	Jump if no zero generated to 2006H
200D					06	Lower address byte
200E					20	Upper address byte
200F		LXI		H, FFFF H	21	Initialise HL pair to mem loc FFFFH
2010					FF	Lower address byte
2011					FF	Upper address byte
2012	STOP	RST 1			CF	Stop program execution

Before execution

Memory locations	Data
207F	05
2080	21
2081	36
2082	CF
2083	AB
2084	DE

After execution

Memory locations	Data
207F	05
2080	21
2081	36
2082	CF
2083	AB
2084	DE

Result: thus we have performed the program to search for the given data in a block of data.

Q. 11

Practical 9

dim:

a 8 bit number is stored in memory location 2400H. Write a program to count zero in the given number. Store result in memory loc 2500H.

Code:

ADDRESS	LABEL	OPCODE	OPERAND	HEX CODE	COMMENTS
2000	START	MVI	C,08H	0E	store the data 08H in reg C
2001				08	
2002		MVI	B,00H	06	store data 00H in B reg
2003				00	
2004		LDA	2400H	3A	load acc with data 2400H
2005				00	lower address byte
2006				24	Upper address byte
2007		RRC		0F	Rotate binary content of acc to right
2008		JC	200CH	DA	Jump to mem loc 200CH if carry generated
2009				0C	lower address byte
200A				20	Upper address byte
200B		INR	B	04	Increment B reg by 1
200C		DCR	C	01	Decrement C reg by 1
200D		JN2	2007	C2	Jump to 2007 if no zero generated
200E				07	lower address byte
200F				20	upper address byte
2010		MOV	A,B	7B	Move content of reg B to accumulator
2011		STA	2500H 32 STA 2500H	2500H	Store content of accumulator in 2500H
2012				00	lower address byte
2013				25	Higher address byte
2014	STOP	RST 1		CF	stops the program execution.

Before execution

Memory location	Data
2400	CA
2500	00

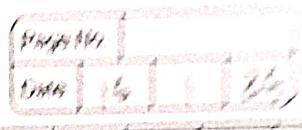
After execution

Memory location	Data
2400	CA
2500	04

Result: thus we have performed a program to count zero's in a given number

Q. 11

Practical 10



Ques :-

Write a program to find how many times address ADH appears in memory block starting from 2030H and length of block is stored at 202FH. Store the result in 2037H

Sol :-

ADDRESS	LABEL	OPCODE	OPERAND	HEX CODE	COMMENT
2000	START	MVI	C,00H	0E	Store data 00H in reg C
2001				00	
2002		MVI	A,ADH	8E	Store data ADH in acc
2003				A1	
2004		LXI	H,202FH	21	Initialize HL pair to mem loc 202FH
2005				2F	Lower address byte
2006				20	Upper address byte
2007		MOV	B,M	46	Move content of M to reg B byte
2008		INX	H	23	Increment HL pair by 1
2009		CMP	M	BE	Compare content of M with Acc
200A		JNZ	200EH	C2	Jump if no zero generated to mem loc 200EH
200B				0E	Lower address byte
200C				20	Upper address byte
200D		INR	C	0C	Increment C reg by 1
200E		INX	H	23	Increment HL pair by 1
200F		DCR	B	05	Decrement B reg by 1
2010		JNZ	2009H	C2	Jump if no zero generated to mem loc 2009H
2011				09	Lower address byte
2012				20	Upper address byte
2013		MOV	A,C	79	Move content of C reg into acc
2014		STA	2037H	32	Store contents of acc into 2037H
2015				37	Lower address byte
2016				20	Upper address byte

Page No.			
Date	16	1	26

ADDRESS	LABEL	OPCODE	OPERAND	HEX CODE	COMMENT
2017	STOP	RSTI		CF	Stop program execution

Before execution

Memory location	Data
202F	05
2030	35
2031	CF
2032	AD
2033	26
2034	AD
...	...
...	...
2037	00

After execution

Memory location	Data
202F	05
2030	35
2031	CF
2032	AD
2033	26
2034	AD
...	...
...	...
2037	02

Result: Thus we have performed a program to count the number of times a data appears in given memory block.