VIVEKANANDA COLLEGE

THAKURPUKUR

KOLKATA-700063

NAAC ACCREDITED 'A' GRADE

Topic: 8085 Instruction and programming

Course Title: Microprocessor and Microcontrollers

Paper: GE-4

Unit:

Semester: 4

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Name of the Department: Electronics

el 8085

Instruction :-

Depending on the operation of the available instruction we have the following catagories,

i) Data transfer group.
ii) Arithmatic group.
iii) logical group.
iv) Brunch Control group.
v) Machine Control group.

i) Data transfer group :-

r = register

1) MVI r, data

e.g→ MVI E, 12 H [Move immidiatly 12 H in register E]

MVI H, 02 H

MVI L, AB H

MVI A, 32 H

MVI M, C5 H

2) MOV r1, r2

r1 = Destination resistor
r2 = Source resistor

e.g→ MOV B, L, B

MOV H, A

MOV A, M

3) LDA memory address ↓

(Load Directly accumulator)

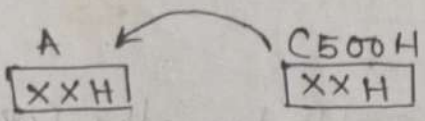
[load accumulator directly with the contain of the specified memory add]

e.g→ LDA C500 H

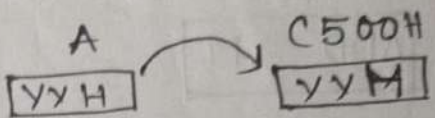
4) STA memory address [Store the Containt of accumulation into the Specified memory add]

e.g) STA C500H

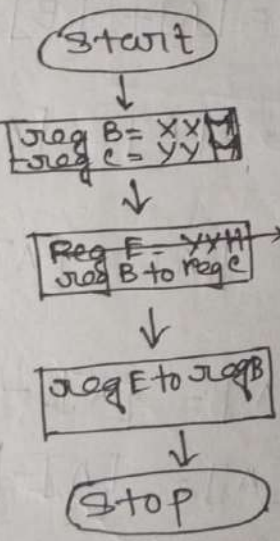
LDA C500H



STA C500H



Write an ALP to Swap the Containt of two resistors. & Load XXH in resistor B and YYH in resistor C.



Memory Addresses	Opcode	Mnemonics	Operands	Comments
8000H	06, XX	MVI	B, XXH	reg B = XXH
8001H	0E, YY	MVI	C, YYH	reg C = YYH
8004H	59	MOV	E, C	the containt of registor C in reg E
8005H	48	MOV	C, B	the contain of reg B in reg C
8006H	43	MOV	B, E	the containt of reg E in reg B
8007H	76	HLT		

ii) Arithmatic group:-

1) ADD r → [A] = [A] + [r]

eg→ ADD B → [A] = [A] + [B]

ADD H

ADD M

2) ADI data → ADD immidiate the contain of accumulator to the specified data.

e.g→ ADI 05H

[A] = [A] + data.

3) ADC r → [A] = [A] + [r] + Carry

g→ ADC B → [A] = [A] + [B] + Carry.

4) ACI data → [A] = [A] + data + Carry.

e.g→ ACI 32H → [A] = [A] + 32H + Carry

5) SUB r → [A] = [A] - [r]

e.g→ SUB C → [A] = [A] - [C]

6) SBI data → [A] = [A] - data

e.g→ SBI 06H

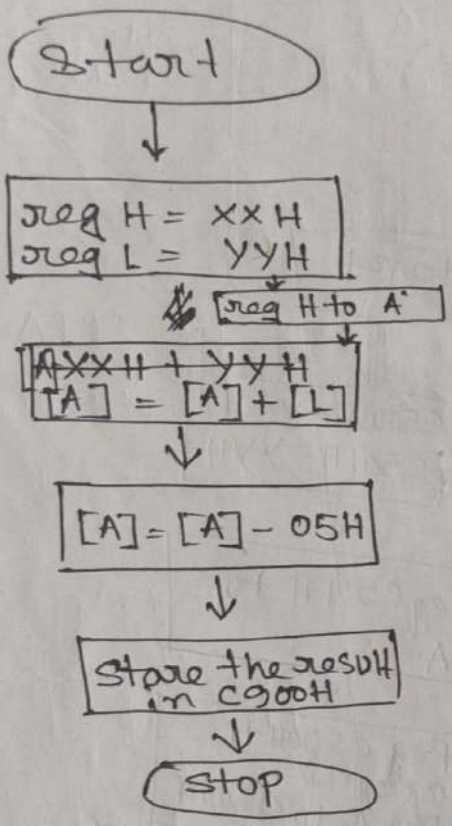
7) SBB r → [A] = [A] - [r] - borrow

.g→ SBB D → [A] = [A] - [D] - borrow

8) SBI data → [A] = [A] - data - borrow

e.g→ SBI 59H → [A] = [A] - 59H - borrow

Write an ALP to add to 8 bit ~~a~~data. Now Subtract 05H from the Sum. Load the inputs in resister H and reg L and Store the ~~finale~~ result in memory add C900 H.



Memory addresses	opcode	Mnmonics	Operands	Comments
8000H	26, XX	MVI	H, XX H	H = XX H
8002H	2E, YY	MVI	L, YY H	L = YY H
8004H	7C	MOV	A, H	~~get the data Contained of reg H into A~~ from H to A
8005H	85	ADD	L	A = A + L
8006H	D6, 59	SBI	59 H	A = A - 59H
8008H	32, 00, C9	STA	C900H	~~Move data~~ store the result in memory
~~8008H~~ ~~800AH~~ 800BH	76	HLT		

Instruction:-
logical group:-

Instructions for OR operation:-

1) ORA r

[A] = [A] OR [r]

03 H → 0000 0011
92 H → 1001 0010 [OR]
1001 0011
9 3 H

56 → 0101 0110 [OR]
08 → 0000 1000
0101 1110
5 E

e.g→ ORA B
[A] = [A] OR [B]

2) ORI data.

[A] = [A] OR data.

e.g→ ORI 08 H

Instruction for AND operation:-

1) ANA r

e.g→ ANA H
[A] = [A] AND [H]

A→62H 0110 0010
H→99H 1001 1001
0000 0000
0 0

2) ANI data.

e.g→ ANI 32H.

Instruction for X-OR operation:-

1) XRA r
[A] = [A] ⊕ [r]

e.g→ XRA C
[A] = [A] ⊕ [C]

2) XRI data.

eg→ XRI 05H

- Instruction for 1's compliment (NOT):—

CMA (Complement of the component of accumulation)

Write an ALP to ~~find~~ out the ~~two~~ 2's Complement of the Content of register B (55H).

8000H	MVI	B, 55H	move data 55H to reg B
8002H	MOV	A, B	move content of B to ~~reg~~ Acc.
8004H	CMA		1's compliement
8005H	ADI	01H	[A] = [A] + 01H /2's complimen
8006H	HLT		Halt.

gical Compairisen :—

1) CMP r

[A] ~ [r]

7 ~ 5	7 ~ 7
C_S=0	Z=1
Z=0	
S=0	

e.g→

CMP B

[A] ~ [B] (no result genarated. only flags are effected)

7 ~ 9.

C_Z = 1

S = 1.

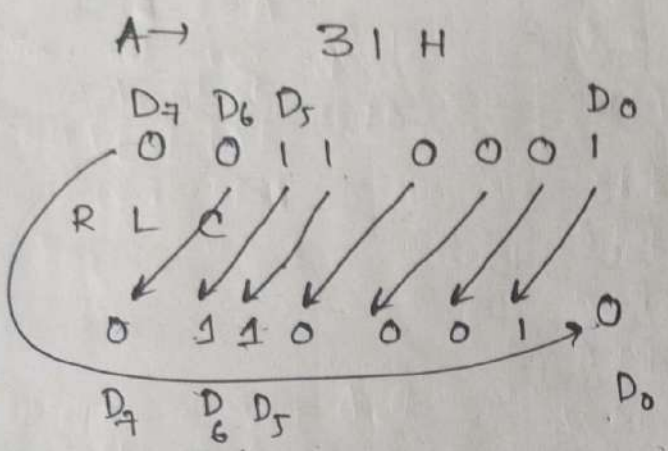
2) CPI data.

[A] ~ data.

~~Left Shift / right Shift (rotation)~~

RLC (exclusively on the content of accumulator)

Rotated left the Content of accumulator by one bit.



- RRC

Rotated right the content of accumulator by one bit.

the carry flag is not effected.

- RAL

Rotated the Content of accumulator left by one bit through carry status flag.

- RAR

Rotated the content of accumulator right by one bit through Carry flag.

Arithmetic group :—

> INX rp

r = register pair

[rp] = [rp] + 1

e.g → INX D ⇒ [DE] = [DE] + 1

INX H ⇒ [HL] = [HL] + 1

INX B ⇒ [BC] = [BC] + 1.

let H = C0H

L = 00H

INR H

INR H [H] = [H] + 1

→ C1 H.

INX H [HL] = [HL] + 1

⇒ C001 H

DCX rp.

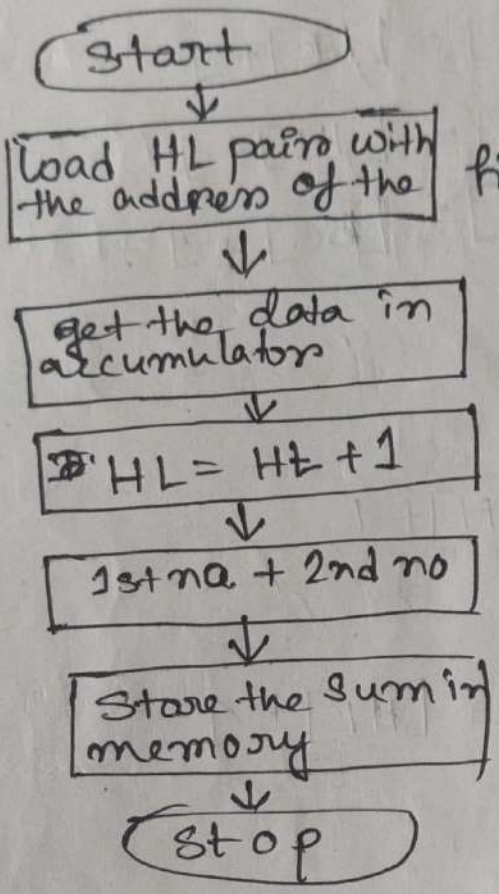
e.g → DCX H

DCX D

DCX B.

blem

Write an ALP to add two 8 bit data. Load the inputs in C500H and C501H. Store the sum in D500H.



Memory add	Opcodes	Mnmonics	Operands	comment
8000H	21,00,C5	LXI	H, C500H	Load HL p with the add of C500H
8003H	7E	MOV	A, M	move the d to Accumul from M
8004H	23	INX	H	[HL] = [HL]+
8005H	86	ADD	M	[A] = [A]+
8006H	32,00,D5	STA	D500H	Store data D500H
8009H	76	HLT		Halt.

Data transfer Group:-

Let 1234 H is Kept in C500H and C501H.

C501H
| 12 | upper 8 bits of data.

C500H
| 34 | lower 8 bits of data.

1 LHLD memory address

(Load HL pair with the ~~16~~ b content of "memory address" and "memory address+1")

e.g→
LHLD C500H

2 XCHG

(exchange the contents between HL pair and DE pair)

3 SHLD memory address

~~eg→~~

(store the content of HL ~~mpair~~ pair in ~~S~~two consicutive memaory location)

e.g→ SHLD D508

H	L
43	21

D	E
+ 12	34
55	55
H ↓	L ↓
D509H	D508H