



LAB MANUAL
ELECTRICAL ENGINEERING

DIPLOMA
IV SEMESTER
MICROPROCESSOR AND INTERFACING

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EXPERIMENT NO – 01
EXAMINING THE CONTENTS OF MEMORY LOCATION AND
REGISTERS

AIM–Write an assembly language program to examine the contents of memory location and registers.

APPARATUS REQUIRED- 8085 microprocessor kit.

THEORY-

PROGRAM-

To examine memory location

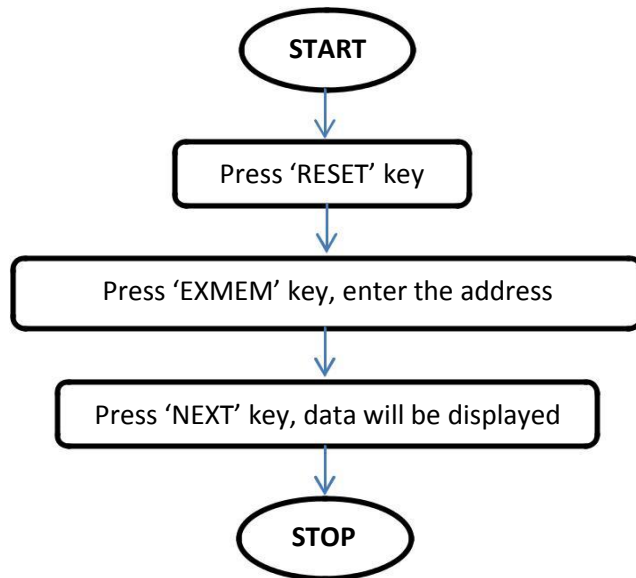
- Press 'RESET' key.
- Press 'EXMEM' key, a dot will be displayed in address field.
- Enter any memory location and press 'NEXT' key.
- Data will be displayed in the data

field. To examine register

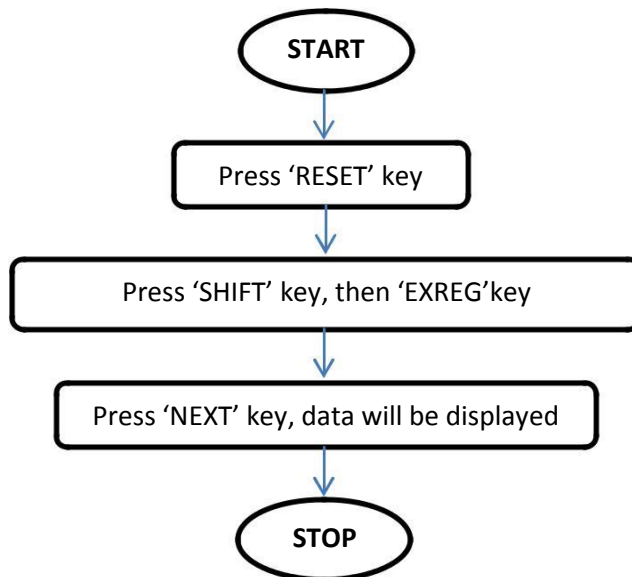
- Press 'RESET' key.
- Press 'SHIFT' key, then 'EXREG'.
- Enter any register
- Data will be displayed in the data field.
- Change with new data.
- Press 'FILL' key

FLOW CHART-

To examine the contents of memory location



To examine the contents of register



OBSERVATION-

Memory location	Data
2100H	21
2101H	1A

Register	Data
B	23
C	2A

RESULT- Thus we examined the contents of memory location and register.

EXPERIMENT NO-02
MODIFYING THE CONTENTS OF MEMORY LOCATION AND
REGISTERS

AIM- Write an assembly language program to modify the contents of memory location and registers.

APPARATUS REQUIRED- 8085 microprocessor kit.

THEORY-

PROGRAM-

To modify memory location

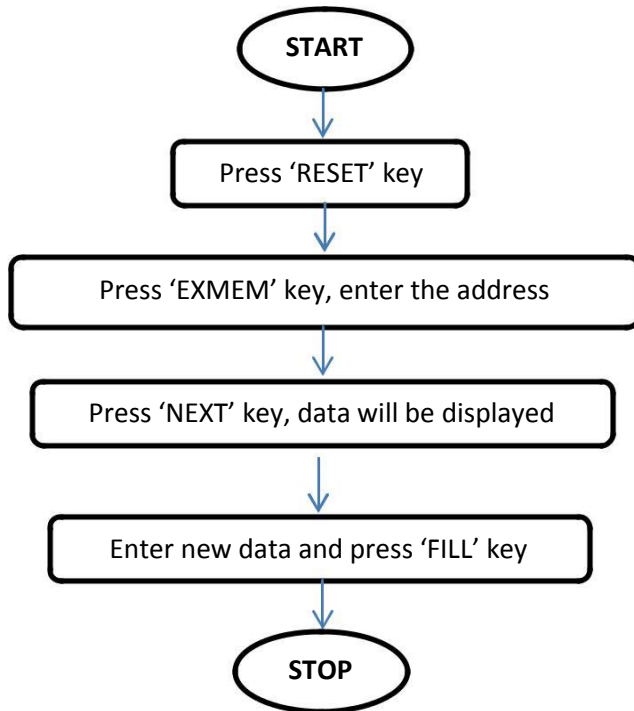
- Press 'RESET' key.
- Press 'EXMEM' key, a dot will be displayed in address field.
- Enter any memory location and press 'NEXT' key.
- Data will be displayed in the data field.
- Change with new data.
- Press 'FILL' key

To modify register

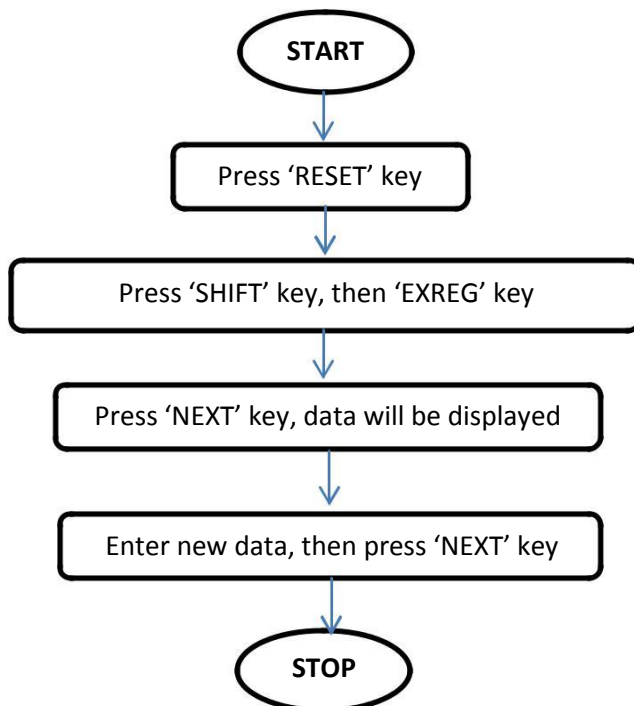
- Press 'RESET' key.
- Press 'SHIFT' key, then 'EXREG'.
- Enter any register
- Data will be displayed in the data field.
- Change with new data.
- Press 'FILL' key

FLOW CHART-

To modify the contents of memory location



To modify the contents of register



OBSERVATION-

Memory location	Old Data	New data
2100H	21	33
2101H	1A	12

Register	Old Data	New data
B	23	76
C	2A	21

RESULT- Thus we examined the contents of memory location and register.

EXPERIMENT NO – 03
ADDITION OF TWO 8-BIT NUMBERS

AIM – Write an assembly language program to add two 8- bit numbers specified in the memory location.

APPARATUSREQUIRED- 8085 microprocessor kit.

THEORY-

PROGRAM-

ADDRESS	OP CODE	MNEMONIC	OPERAND	DESCRIPTION
2003	21,00,20	LXI	H,2000H	Load HL pair with the data of memory location specified for first number
2006	7E	MOV	A,M	Load accumulator with data of 2000
2007	23	INX	H	Increment the HL pair for second number
2008	86	ADD	M	Add the data of 2001 with accumulator
2009	23	INX	H	Increment HL pair for result
200A	77	MOV	M.A	Move the content of A to the 2002H
200B	EF	RST		Stop

PROCEDURE-

- Enter program.
- Enter data.
- Execute program.
- Check result.

Enter program

- Enter the above program.
- Press 'FILL' key.

Enter data

- Press 'EXMEM' key.
- Enter the address for first number(2000H), press 'NEXT' key..
- Enter first number, press 'NEXT' key.

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- Enter second number in the next address shown.
- Press 'FILL' key.

Execute program

- Press 'GO' key.
- Enter starting address of program(2003H).
- Press 'FILL' key.

Check result

- Press 'RESET' key.
- Press 'EXMEM' key.
- Enter address of first number(2000H).
- Press 'NEXT', data entered previously will be shown.
- Press 'NEXT', data in next address will be shown.
- Press 'NEXT' key, result will be shown.

OBSERVATION-

ADDRESS	INPUT DATA
2000	21
2001	24
2002- Result	45

RESULT- Thus we added the two given 8-bit numbers in specified memory location and checked the result.

EXPERIMENT NO- 04
SUBTRACTION OF TWO 8-BIT NUMBERS

AIM– Write an assembly language program to subtract two 8- bit numbers specified in the memory location.

APPARATUSREQUIRED- 8085 microprocessor kit.

THEORY-

PROGRAM-

ADDRESS	OP CODE	MNEMONIC	OPERANDS	DESCRIPTION
2000	21,51,20	LXI	A,2051H	Load HL pair with the data of memory location specified for first number
2003	7E	MOV	A,M	Load accumulator with data of 2051
2004	23	INX	H	Increment contents of HL pair
2005	96	SUB	M	Subtract the content of memory with accumulator
2006	32,53,20	STA	2053H	Store result in 2053H
2009	76	HLT		Stop

PROCEDURE-

- Enter program.
- Enter data.
- Execute program.
- Check result.

Enter program

- Enter the above program.
- Press 'FILL' key.

Enter data

- Press 'EXMEM' key.
- Enter the address for first number (2000H), press 'NEXT' key..
- Enter first number, press 'NEXT' key.
- Enter second number in the next address shown.

- Press 'FILL' key.

Execute program

- Press 'GO' key.
- Enter starting address of program (2003H).
- Press 'FILL' key.

Check result

- Press 'RESET' key.
- Press 'EXMEM' key.
- Enter address of first number (2000H).
- Press 'NEXT', data entered previously will be shown.
- Press 'NEXT', data in next address will be shown.
- Press 'NEXT' key, result will be shown.

OBSERVATION-

ADDRESS	INPUT DATA
2051	45
2052	24
2053- Result	21

RESULT- Thus we subtracted the two 8-bit numbers in specified memory location and checked the result.

EXPERIMENT NO- 05
1's COMPLEMENT OF AN 8-BIT NUMBER

AIM- To find the 1's complement of an 8-bit number.

APPARATUS REQUIRED- 8085 microprocessor kit.

THEORY-

PROGRAM-

ADDRESS	OP CODE	MNEMONIC	OPERAND	DESCRIPTION
2000	3A,51,20	LDA	2051H	Get number into accumulator
2003	87	ADD	A	Add A to A shift binary number to left by one bit
2004	32,52,20	STA	2052H	Store result
2007	76	HLT	2052H	Stop

PROCEDURE-

- Enter program.
- Enter data.
- Execute program.
- Check result.

Enter program

- Enter the above program.
- Press 'FILL' key.

Enter data

- Press 'EXMEM' key.
- Enter the address for number (2051H), press 'NEXT' key..
- Enter number.
- Press 'FILL' key.

Execute program

- Press 'GO' key.
- Enter starting address of program (2000H).
- Press 'FILL' key.

Check result

- Press 'RESET' key.
- Press 'EXMEM' key.
- Enter address of number(2051H).
- Press 'NEXT' key, result will be shown.

OBSERVATION

ADDRESS	DATA	BINARY CODE
2051H	45H	01000101
2052	BAH	10111010

RESULT- Thus we obtained the 1's complement of the given number in specified memory location and checked the result.

EXPERIMENT NO- 06
2'S COMPLEMENT OF AN 8-BIT NUMBER

AIM- Write an assembly language program to find the 2's complement of an 8-bit number.

APPARATUS REQUIRED- 8085 microprocessor kit.

THEORY-

PROGRAM-

ADDRESS	OP CODE	MNEMONIC	OPERAND	DESCRIPTION
2000	3A,51,20	LDA	2051H	Get number into accumulator
2003	2F	CMA		Complement the number
2004	3c	INR	A	Add 1(2's complement of number)
2005	32,52,20	STA	2052H	Store result in 2052H
2008	76	Hlt		Stop

PROCEDURE-

- Enter program.
- Enter data.
- Execute program.
- Check result.

Enter program

- Enter the above program.
- Press 'FILL' key.

Enter data

- Press 'EXMEM' key.
- Enter the address for number (2051H), press 'NEXT' key..
- Enter number.
- Press 'FILL' key.

Execute program

- Press 'GO' key.
- Enter starting address of program (2000H).
- Press 'FILL' key.

Check result

- Press 'RESET' key.
- Press 'EXMEM' key.
- Enter address of number(2051H).
- Press 'NEXT' key, result will be shown.

OBSERVATION

ADDRESS	DATA	BINARY CODE
2051H	45H	01000101
2052	BBH	10111011

RESULT- Thus the 2's complement of the given 8-bit number is obtained.

EXPERIMENT NO-07
MULTIPLICATION OF TWO 8-BIT NUMBERS AND THE RESULT
WILL BE 8-BIT NUMBER

AIM- Write an assembly language program to multiply two 8-bit number and result is 8-bit.

APPARATUSREQUIRED- 8085 microprocessor kit

THEORY-

PROGRAM-

ADDRESS	OP CODE	MNEMONIC	OPERAND	DESCRIPTION
2000	2A,51,20	LHLD	2051H	Multiplier and multiplicand in HL pair, L-multiplier, H-multiplicand
2003	3E,00	MVI	A,00	Set accumulator = 0
2005	84	ADD	H	Add multiplicand to accumulator(A+H)A
20062D	2D	DCR	L	Decrement multiplier L=L-1
2007	C2	JNZ		If zero flag is not set, repeat
2008	32,53,20	STA	2053H	Store result
200B	76	HLT		Stop

PROCEDURE-

- Enter program.
- Enter data.
- Execute program.
- Check result.

Enter program

- Enter the above program.
- Press 'FILL' key.

Enter data

- Press 'EXMEM' key.
- Enter the address for first number (2051H), press 'NEXT' key.
- Enter number,press 'NEXT' key.
- Enter the address for second number (2051H), enter second number.
- Press 'FILL' key.

Execute program

- Press 'GO' key.
- Enter starting address of program (2000H).
- Press 'FILL' key.

Check result

- Press 'RESET' key.
- Press 'EXMEM' key.
- Enter address of number.
- Press 'NEXT' key, result will be shown.

OBSERVATION

ADDRESS	INPUT DATA
2051	05H(00000101H)
2052	06H(00000110)
2053	1E(00011110)

RESULT- Thus we multiplied the two 8-bit numbers in specified memory location and checked the result.

EXPERIMENT NO-08
DIVISION OF TWO 8-BIT NUMBERS

AIM- Write an assembly language program to divide two 8-bit numbers.

APPARATUSREQUIRED- 8085 microprocessor kit

THEORY-

PROGRAM-

ADDRESS	OP CODE	MNEMONIC	OPERAND	DESCRIPTION
2000	3A,52,20	LDA	2052H	Get divisor into accumulator
2003	47	MOV	B,A	Save divisor in B
2004	3A,51,20	LDA	2051H	Get dividend into accumulator
2007	87	ADD	A	Add A to A shift dividend and quotient left by one bit
2008	90	SUB	B	Subtract divisor from dividend (A-B)
2009	32,53,20	STA	2053H	Store quotient in 2054H and remainder in 2055H
200C	76	HLT		Stop

PROCEDURE-

- Enter program.
- Enter data.
- Execute program.
- Check result.

Enter program

- Enter the above program.
- Press 'FILL' key.

Enter data

- Press 'EXMEM' key.
- Enter the address for dividend -489BH (48 in 2052)press 'NEXT' key and 9B in 2051
- Enter number,press 'NEXT' key.
- Enter the address for second number (2051H), enter second number.
- Press 'FILL' key.

Execute program

- Press 'GO' key.
- Enter starting address of program (2000H).
- Press 'FILL' key.

Check result

- Press 'RESET' key.
- Press 'EXMEM' key.
- Enter address of number.
- Press 'NEXT' key, result will be shown.

OBSERVATION

ADDRESS	INPUT DATA
2051	05H(00000101H)
2052	06H(00000110)
2053	1E(00011110)

RESULT- Thus we multiplied the two 8-bit numbers in specified memory location and checked the result.