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Assembly Language Programing (PART 3)

Label	Mnemonics	Comments
L1	MOV C, A	; Move A to C reg.
	LXI H, D001H	; Load HL with D001
	LXI D, D00AH	; Load DE with D00A
	LDAX D	; Load Acc with M whose address is in HL
	MOV B, M	; Move the contents of Memory location whose Address is in HL to B
	XCHG	; Exchange HL with DE
	MOV M, B	; Move B to Memory
	STAX D	; Store Accumulator to Memory
	XCHG	; Exchange HL with DE
	INX H	; Increment HL
	DCX D	; Decrement DE
	DCR C	; Decrement C
	JNZ L1	; Jump if No Zero to L1
	HLT	; Stop

- 138) There is block of memory, from 2501H to 250AH. Write a program to replace the odd numbers with data 'FFH' in given block. **(Oct. 2014)**

Ans. :

Label	Mnemonics	Comments
L2	MVI C, 0A H	; Move Immediate 0A to C
	LXI H, 2501 H	; Load HL with 2501 H
	MOV A, M	; Move M to Accumulator
	RRC	; Rotate Accumulator Right
	JNC L1	; Jump if no carry to L1
L1	MVI M, FF H	; Move Immediate FF to M
	INX H	; Increment HL
	DCR C	; Decrement C
	JNZ L2	; Jump if No Zero to L2
	HLT	; Stop

- 139) Write a program in assembly language to exchange the nibbles of each memory location contents of a block which begins from 2501H, the length of block is at 2500H. Store the result at same memory locations. **(Oct. 2014)**

Ans. :

Label	Mnemonics	Comments
L1	LXI H, 2500 H	; Load HL with 2500 H
	MOV C, M	; Move M to C
	INX H	; Increment HL by 1
	MOV A, M	; Move M to Accumulator
	RRC	; Rotate Accumulator Right by 1 bit four times
	RRC	
	RRC	
	RRC	
	MOV M, A	; Move A to Memory
	DCR C	; Decrement C by 1
	JNZ L1	; Jump if No Zero to L1
HLT	; Stop	

- 140) Write a program to check, weather 2 Hex digits stored at D000H are same or not. If digits are same then memory location D001H should contain 00H else FFH.

(Oct. 2014)

Ans. :

Label	Mnemonics	Comments
L1	LXI H,D000H	; Load HL with D000 H
	MOV A, M	; Move M to Accumulator
	ANI 0F H	; AND Immediate with Acc.
	MOV B, A	; Move A to B
	MOV A, M	; Move M to Acc
	ANI F0 H	; AND Immediate with Acc.
	RRC	; Rotate Acc. Right by 1 bit four times
	RRC	
	RRC	
	RRC	
	CMP B	; Compare B with Acc.
	JZ L1	; Jump if Zero to L1
	INX H	; Increment HL
	MVI M, FF H	; Move Immediate FF to M
	JMP L2	; Jump to L2
	INX H	; Increment HL
	MVI M, 00 H	; Move Immediate 00 H to M
L2	HLT	; Stop

- 141) Write a program in assembly language to add 3 byte number stored from D000H with another 3 byte number stored from D100H memory address. Store the 3 byte result from memory location D200 starting with lower byte. **(Oct. 2014)**

Ans. :

Label	Mnemonics	Comments
	LDA D000H	; Load Acc. with D000 H
	LXI H, D100 H	; Load HL with D100 H
	ADD M	; Add M with Acc.
	STA D200 H	; Store Acc. to D200 H
	LDA D001 H	; Load Acc. with D001 H
	LXI H, D101 H	; Load HL with D101 H
	ADC M	; Add M to Acc. with carry
	STA D201 H	; Store Acc. to D201 H
	LDA D002 H	; Load Acc. with D002 H
	LXI H, D102 H	; Load HL with D102 H
	ADC M	; Add M to Acc. with carry
	STA D202 H	; Store Acc. to D202 H
	HLT	; Stop

Imagined Output will be

D000 H	02	D100 H	02	D200 H	04
D001 H	06	D101 H	05	D201 H	0B
D002 H	03	D102 H	02	D202 H	05

- 142) Write an assembly language program to multiply the content of 2000H by the content of 2000H. store the 16 bit result in the memory location 2010H and 2011H. **(Oct. 2015)**

Ans. :

Label	Mnemonics Operand	Comments
	XRA A	; Initialize accumulator with 00H
	MOV B, A	; Initialize register B with 00H
	LXI H, 2000H	; Initialize H-L Pointer to address 2000H
	MOV C, M	; Get first number in register C
	INX H	; Get address of second number in H-L pair
VY	ADD M	; Add two numbers
	JNC XX	; Is carry ? No - Jump to label XX
	INR B	; Increment count in register B by 1 to store MSB

Label	Mnemonics Operand	Comments
XX	DCR C	; Decrement count in register by 1
	JNZ YY	; Is zero? No – Jump to label yy
	STA 2010H	; If yes, store LSB of product at 2010H
	MOV A, B	; Get MSB in register A
	STA 2011H	; Store MSB of product at 2011H
	HLT	; Stop processing

- 143) Write an assembly language program to add the four byte number starting from C000H with another four byte number starting from C100H. Store the four byte result starting from C200H and carry at C204H. **(Oct. 2015)**

Ans. :

Label	Mnemonics Operand	Comments
	LXI SP, FF00H	; Initialize stack pointer
	LXI H, C100H	; Address of LSB of 2nd number
	LXI B, C000H	; Address of LSB of 1st number
	LXI D, C200H	; Address of LSB of Sum
	STC	; Set carry flag
	CMC	; Reset carry flag
	XTHL	; Save the H-L pair in stack
	LXI H, 0004H	; Byte count in reg. L
BACK	XTHL	; Save count in stack and retrieve HL pair
	LDAX B	; Get byte of 1st number of accumulator
	ADC M	; Addition of byte of 1 st and 2 nd number
	STAX D	; Store the sum of byte in Memory
	INX H	} Get address of next memory locations
	INX D	
	INX B	
	XTHL	; Save H-L pair in stack and retrieve the count
	DCR L	; Decrement count by 1
	JNZ BACK	; Is all bytes are added if no-jump to Label BACK
	MVI A, 00H	; If yes, clear the accumulator
	RAL	; Get carry in accumulator
	STAX D	; Store carry bit in memory
	HLT	; Stop processing

- 144) Write an assembly language program to count the odd numbers in a memory block starting from 2300H to 2320H. Store the count at memory location 2400H. (Oct. 2015)

Ans. :

Label	Mnemonic operand	Comments
	MVI C, 21H	; Place the count in register C
	XRA A	} Initialize the register B = 00H
	MOV B, A	
	LXI H, 2300 H	; Initialize H-L pair
Loop 2	MOV A, M	; Get the number in A
	RRC	; Rotate the accumulator to right
	JNC LOOP1	; Is number is odd ? No – jump to label loop 1
	INR B	; Yes, increment count
Loop 1	INX H	; Address of next number
	DCR C	; Decrement test count
	JNZ Loop2	; Is zero ? No – Jump to label loop2
	MOV A, B	; Get count of odd no. in accumulator
	STA 2400H	; Store the count. In memory 2400H
	HLT	; Stop processing

- 145) The two memory block starts from 3000H and 3100H each containing 16 bytes. Write an assembly language program to exchange the content of these blocks. (Oct. 2015)

Ans. :

Label	Mnemonic operand	Comments
	MVI C, 10H	; Get count in register C
	LXI H, 3000H	; Address of first block in HL pair
	LXI D, 3100H	; Address of second block in D-E pair
REP	MOV B, M	; Get number form first block in reg. B.
	LDAX D	; Get number from second block in accumulator
	MOV M, A	; Store the number in first block
	MOV A, B	; Get the number of first block in accumulator
	STAX D	; Store the number in second block
	INX D	} Get address of next number
	INX H	
	DCR C	; Decrement count by 1
	JNZ REP	; Is zero? No-jump to label REP
	HLT	; Yes, stop processing

146) A memory block from 4000H containing 16 hexadecimal numbers. Write an assembly language program to count the numbers which has identical nibbles. Stores to count in memory location 4010H. (Oct. 2015)

Ans. :

Label	Mnemonics operand	Comments	
YY	MVI B, 00H	; Initialize register B as counter	
	MVI C, 10H	; Initialize test count with 10H	
	LXI H, 4000H	; Initialize H-L pair by 4000H	
	MOV A, M	; Get the number in accumulator	
	RRC	} Exchange the nibble of the number	
	RRC		
	RRC		
	RRC		
	XX	CMP M	; Compare with original number
		JNZ XX	; Is zero? No-jump to label XX
INR B		; Increment count by 1	
INX H		; Get address of next number	
DCR C		; Decrement test count	
JNZ YY		; Is zero? No-Jump to label YY	
MOV A, B		; Yes, get count in accumulator	
STA4010H		; Store the count in memory	
	HLT	; Stop processing	

147) Write an assembly language program to test weather the data DCH is present in the memory block which starts from 2000H. If the data is present in block the HL pair should contain its address otherwise it should contains FFFFH. (Oct. 2015)

(Test for the first occurrence only)

Ans. :

Label	Mnemonics Operand	Comments
YY	MVI B, 10H	; Get test count in register B
	MVI A, DCH	; Number to be tested in accumulator
	LXI H, 2000H	; Initialize H-L pair with 2000H
	CMP M	; Check the number with DCH
	JZ XX	; Is number DCH of Yes, Jump to label XX
	INX H	; No, get address of next number
	DCR B	; Decrement count by 1
	JNZ YY	; Is zero? No. Jump to Label YY.
XX	LXI H, FFFFH	; Get FFFFH in H-L pair since no, is not found.
	HLT	Stop processing

- 148) Write an Assembly Language Program to multiply a number stored at location 1050 with a number at location 1051. Result is 2-byts. Stored result at locations 1052 and 1053. **(March 2016)**

Ans. :

Label	Mnemonics	Comments
	MVI D,00	; D = 00H
	LXI H, 1050	; set H-L Pointer to 1050 H
	MOV B, M	Take no in B xg
	INX H	; Increment HL contents
	MOV C, M	; take no in C Reg
	MVI A, 00	; clear accumulator
UP	ADD C	; ADD C reg with A reg
	JNC Dn	; Addition carry stored in D reg
Dn	DCR B	; Decrement B reg.
	JNZ UP	; Jump if not zero go to label UP
	INX H	; Increment HL contents
	MOV M, A	; move acc content to mem by 1
	INX H	; Increment HL content by 1
	MOV M, B	; store result in 1053 H
	HLT	; stop

- 149) Write an Assembly Language Program to transfer a block memory starting from 1050H to 1059H to a new location starting from 1070H to 1079H. **(March 2016)**

Ans. :

Label	Mnemonics	Comments
	LXI H, 1050 H	: Set HL to 1050 H
	LXI D ,1070 H	: Set DE to 1070 H
	MVI B, 0A	: Set count B = 0AH
UP	MOV A, M	: get source from memory
	STAX D	: load destination block in Acc
	INX H	: Increment HL pair
	INX D	: increment DE pair
	DCR B	: decrement count & check
	JUZ up	Whether it is zero or not?
	HLT	: Stop

- 150) A two byte number is stored at location C000 H and C001 H. Write an Assembly Language Program to rotate this number to left side by 3 Places and store the rotated number in BC register pair. (March 2016)

Label	Mnemonics	Comment
	LHLD C000	; Get no in HL pair
	MVI C, 03	; Get 3 in c reg
UP	DAD H	; Rotate number to left side by 3 places
	JNC dn	; Jump if no carry go on label dn
	INR L	; Increment reg 1
dn	DCR C	; Decrement c reg
	JNZ Up	; Jump if not zero go on label Up
	MOV B, H	; store no in BC reg pair
	MOV C, L	

- 151) Write an Assembly Language program to add 2 decimal numbers stored at 1050 H and 1051 H. Store result at 1052 H and 1053 H. (March 2016)

Ans. :

Label	Mnemonics	Comments
	LXI H, 1050 H	; set HL pointer to 1050 H
	MOV A, M	; store 1 st no in A reg
	INX H	; point HL pair to 2 nd no
	MVI C, 00	; move 00 data into C reg.
	ADDM	; Add two numer
dn	DAA	; Decimal adjust accumulator
	JNC DN	; Jump if no carry go on label DN
	INR C	; If carry increment MSB in C reg
dn	INX H	; Increment HL by 1
	MOV M, A	; Get LSB in 1052 H
	INX H	; Increment HL by 1
	MOV M, C	; Get MSB in 1053 H
	HLT	; Stop

- 152) Write an Assembly Language Program to increment the contents of alternate memory locations each by two from 1051 H to 1060 H. (March 2016)

Ans. :

Label	Code	Comments
	MVI C, 08 H	: set C = count = 08 H
	LXI H, 1050 H	: set HL with 1050 H
UP :	INR M	
	INR M	: Increment memory contents by 2
	INR H	
	INX H	: Increment HL pair two times
	DCR C	: Decrement count C
	JNZ up	: Go to Increment memory if count is not zero ?
	HLT	

- 153) A memory block starts from C301 H and its block length count is stored at C300 H. Write an assembly language program to count the even numbers and odd numbers present in the block. Store the even number count at C400H and odd number count at C401 H.

(June 2016)

Ans. :

LABEL	MNEMONICS	COMMENTS
	MVI B, 00H.	; Initialized B reg. Content to zero.
	MVI D, 00H	; Initialized D reg. Content to zero.
	LXI H, C300H	; Set H-L pair to C300H.
	MOV C, M	; Get count i.e. Length in reg. C.
	INX H	; Increment H-L pair by 1.
LOOP2	MOV A, M	; Get number from memory to accumulator.
	RRC	; Rotate acc. content right to determine odd/even.
	JC Loop 1	; If carry? jump on Loop 1.
	INR B	; Yes Increment B reg. content by 1.
	JMP Next	; Unconditional jump to Next.
Loop 1	INR D	; Increment D reg. Content by 1.
Next	INX H	; Increment H-L reg. pair by 1.
	DCR C	; Decrement C reg. by 1.
	JNZ LOOP2	; Jump if not zero? Jump on LOOP2.
	MOV A, B	; Move B reg. content to accumulator
	STA C400H	; Store accumulator content at C400H memory location.
	MOV A, D	; Move D reg content to accumulator
	STA C401H	; Store accumulator content at C401H memory location.
	HLT	; Stop microprocessor.

- 154) Write a Assembly Language Program to copy a block of data having starting address 4500 H to new location starting from 4600 H. The length of block is stored at memory location 44FF H.

(March 2017)

Ans. :

Label	Mnemonics and Operand	Comments
	LXI H, 44 FFH	; Set HL with 44FFH.
	MOV C, M	; Store count in C reg
	LXI D, 4600 H	; Set DE with 4600H
Loop	INX H	; Incr. HL by 1
	MOV A, M	; Copy mem content to A
	STAX D	; Store Acc to mem with Add of DE
	INX D	; Incr. DE by 1
	DCR C	; Decr. C by 1
	JNZ Loop	; if c ≠ 0 then go to Loop
	HLT	; Stop

- 155) Write an Assembly Language Program to add two 8-bits BCD numbers stored at memory location 4500 H and 4501 H. Store the two byte BCD result from memory location 4502 H onwards. (March 2017)

Ans. :

Label	Mnemonics and Operand	Comments
next	MVI B, 00	; Store 00 in B reg
	LXI H, 4500 H	; Set HL with 4500 H
	MOV A, M	; Copy mem content to A
	INX H	; Incr. HL by 1
	ADD, M	; Add Acc with mem
	DAA	; Convert Hex to BCD
	JNC next	; if cy = 0 then go to next
	INR B	; Incr. B by 1
	STA 4502 H	; Store Acc to 4502H
	MOV A, B	; Copy B to A
	STA 4503H	; Store Acc to 4503H
HLT	; Stop	

- 156) Write an Assembly Language Program to fill the memory locations 4500 H to 4504 with the Hexadecimal numbers 09 H to 0DH respectively. (March 2017)

Ans. :

Label	Mnemonics and Operand	Comments
Loop	MVI C, 05H	; Store 05 in C reg.
	MVI A, 09H	; Store 09 in Acc.
	LXI H, 4500 H	; Set HL with 4500 H
	MOV M, A	; Copy Acc to Memory
	INX H	; Incr. HL by 1
	INR A	; Incr. Acc. By 1
	DCR C	; Decr. C by 1
	JNZ Loop	; if c ≠ 0 then go to Loop
	HLT	; Stop

- 157) Write an Assembly Language Program to exchange the nibbles o8-bit number stored in memory location 4500H. Store the result at memory location 4501H. (March 2017)

Ans. :

Label	Mnemonics and Operand	Comments
	LXI H, 4500 H	; Set HL with 4500 H
	MOV A, M	; Copy mem. To Acc.
	RRC	} ; Rotation right 4 time to ; exchange nibbles
	RRC	
	RRC	
	RRC	
	RRC	
	STA 4501 H	; Store Acc to 4501 H
HLT	; Stop	

- 158) A block of data is stored in memory location 4500 H. The length of block is stored memory location 44FFH. Write an Assembly Language Program that searches for first occurrence of data D9H in given block. Store the address of this occurrence H.L. pair. If the number is not found then HL pair should contain 5000 H. (March 2017)

Ans. :

Label	Mnemonics and Operand	Comments
Loop	LXI H, 44FF H	; Set HL with 44FFH
	MOV C, M	; Copy mem. to C
	MVI A, D9H	; Store D9 to Acc.
	INX H	; Incr. HL by
	CMP M	; Compare Acc. to mem.
	JZ STOP	; Go to STOP if Z = 1
	DCR C	; Decr. C by 1
	JNZ Loop	' go to Loop if c ≠ 0
STOP	LXI H, 5000 H	; Set HL with 5000 H
	HLT	; Stop

159) A block of data is stored from memory location 4501H and onwards. The length of the block is stored at memory location 4500H. Write an Assembly Language Program to find the sum of block of data. Store the two byte result from memory location 4600. **(March 2017)**

Ans. :

Label	Mnemonics and Operand	Comments
LOOP	LXI H, 4500 H	; Set HL with 4500 H
	MOV C, M	; Copy mem. to C
	MVI A, 00H	; Store A with 00
	MVI B, 00H	; Store B with 00
	INX H	; Incr. HL by 1
	ADD M	; Add mem. with Acc.
	JNC next	; if cy = 0 go to next
STOP	INR B	; Incr. B by 1
	DCR C	; Decr. C by 1
	JNZ LOOP	; if Z = 0 go to LOOP
	STA 4600 H	; Store Acc. To 4600 H
	MOV A, B	' Copy B to A
	STA 4601 H	; Store Acc. To 4601 H
	HLT	; Stop

160) Write an Assembly Language Program to separate the two nibbles of an 8-bit number stored at 7501H. Store the low-order nibble and high-order nibble, respectively, at the locations 7502H and 7503H. **(July 2017)**

Ans. :

LXI H 7501 H	; Load HL reg. pair with 7501H mem.
MOV A, M	; Move mem content to accumulator.

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MOV B, M      ; move mem content to reg. B.
ANI, 0FH     ; AND immediatly 0FH with accumulator content.
MOV C, A     ; move accumulator content to reg. C.
MOV A, B     ; move B reg. content to accumulator.
ANI F0H     ; AND immediatly F0H with accumulator content.
MOV D, A     ; move accumulator content to reg. D.
INX H       ; Increment HL reg. pair by 1 mem. location.
MOV M, C     ; move reg. C content to mem.
INX H       ; increment ent. HL reg. pair by 1 men location.
MOV M, D     ; move reg. D content to mem.
HLT         ; Stop the microprocessor.
    
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161) Write ALP to multiply number stored at 8085H by 09H and store result at 8086H and 8087 H, with lower byte at 8086H. (March 2015)

Ans. :

Label	Mnemonics	Comments
BK	LDA 8085 H	; Load 8085 in A reg
	MOV E, A	; Move A to E
	MVI D, 00 H	; Higher byte of DE pair is 00 H
	LXI H, 0000 H	; clear HL pair
	MVI C, 09 H	; C used as counter , C = 9 H
	DAD D	;(DE) + (HL) = (HL)
	DCR C	;Decrement counter by 1
	JNZ BK	;Jump to BK until counter becomes zero
	SHLD 8086	; Store result at 8084 and 8087
	HLT	; stop

162) Write ALP to find 2's complement of a 16 bit number stored in DE pair. Store result in HL pair. (March 2015)

Ans. :

Label	Mnemonics	Comments
	MOV A, E	; Move E reg. Content to accumulator
	CMA	; Complement lower byte of 16 bit number
	MOV E, A	; Move Accumulator content to reg. E
	MOV A, D	; Move reg. D content to accumulator
	CMA	; Complement Higher byte of 16 bit number
	MOV D, A	; Move accumulator content to reg. D
	INX D	; Add one to get 2's complement
	XCHG	; Store result in HL Pair
	HLT	; stop

- 163) Locate smallest number in a block from 2050 H to 2060H and store it in memory location 2061 H. **(March 2015)**

Ans. :

Label	Mnemonics	Comments
UP	LXI H, 2050 H	; HL pair at starting address
	MVI C, 10 H	; Reg C as Counter
	MOV A, M	; Move contents of memory to Acc.
	INX H	; Next Address
	CMP M	; Compare A to Memory
	JC DOWN	; Is no. in A is smaller ? Yes then jump to DOWN
	MOV A, M	; NO, bring smaller no. in A
DOWN	DCR C	; Decrement Count
	JNZ UP	; Count = 0 ? No Jump to UP
	STA 2061 H	; Store Smallest at 2061 H
	HLT	; Stop

- 164) Write ALP to store data BCH in 20 continuous memory locations starting from 8081 H. **(March 2015)**

Ans. :

Label	Mnemonics	Comments
UP	LXI H, 8081 H	; Set HL pair at Starting Address
	MVI C, 14 H	; Reg. C as counter
	MVI M, BC H	; Move data BC to Memory
	INX H	; Go to next Address
	DCR C	; Decrement C by 1
	JNZ UP	; Jump to UP until counter becomes zero
	HLT	; Stop

- 165) Write ALP to divide number at 6068H by a non-zero number at 6067 H. Store quotient at 6069H and remainder at 606AH. **(March 2015)**

Ans. :

Label	Mnemonics	Comments
	LXI H, 6067 H	; Load HL with 6067 H
	MOV B, M	; Move M to B
	INX H	; Increment HL
	MOV A, M	; Copy dividend to Acc.
	MVI C, 00 H	; Clear Reg. C to store quotient

Label	Mnemonics	Comments
UP	CMP B	; Compare dividend and divisor
	JC DOWN	; if dividend < divisor ? Yes then go to DOWN
	SUB B	; dividend = dividend - divisor
	INR C	; Increment quotient by 1
	JMP UP	; Jump to UP
DOWN	STA 6069 H	; Store remainder in Acc at 6069 H
	MOV A, C	; copy quotient to Acc.
	STA 606A H	; Store quotient in Reg. C at 606A H
	HLT	; stop

- 166) Write ALP to clear register B, if number at memory location 20F9H is palindrome, otherwise store FFH in register B. (March 2015)

[Palindrome No. Ex. FF, 22, AA]

Ans. :

Label	Mnemonics	Comments
	MVI B, FF H	; Assume Number is not palindrome
	LDA 20F9 H	; Take no. in Acc.
	MOV C, A	; Store no. in C reg.
	RRC	; Rotate 4 times right to get reverse of a number
	RRC	
	RRC	
	RRC	
	CMP C	; compare reverse and original number
	JNZ DOWN	; Are they same ? No then Jump to DOWN
	MVI B, 00 H	; Yes Number is palindrome store 00 H in B
DOWN	HLT	; stop

- 167) Write an Assembly Language Program to fill the memory block stored from 7601H to 760FH with the data 00H and FFH alternatively. (July 2017)

Ans. :

Label	Mnemonics	Comments
	MVI C, 0FH	; Initialize counter
	MVI D, 00H	; Move 00 to D register
	MVI E, FFH	; Move FF to E register
	LXI H, 7601H	; Initialize pointer
UP	MOV M, D	; Fill 00 in memory location

Label	Mnemonics	Comments
	DCR C	; Decrement counter
	INX H	; Increment pointer
	MOV M, E	; Fill FF in memory location
	INX H	; Increment pointer
	DCR C	; Decrement counter
	JNZ UP	; Check if counter $\neq 0$, jump on UP
	HLT	; Stop processing

- 168) Write an Assembly Language Program to search the data byte A4H in a memory block stored from 99011H to 990AH. If the search is successful, the HL register pair should contain the address of the location where the specified data byte is found; else, the HL pair should contain 0000H. **(July 2017)**

Ans. :

Label	Mnemonics	Comments
	LXI H, 9900H	; Load HL pair with 9900H
	MOV C, M	; Move count in Reg. C
	MVI A, A4H	; Set accumulator = A4H
LOOP	INX H	; Increment HL pair
	CMP M	; Compare memory and accumulator
	JZ BACK	; If memory location in block = A4, then jump
	DCR C	; Decrement count
	JNZ LOOP	; Repeat if count $\neq 0$
	LXI H, 0000H	; Set HL pair to 0000H if number found
	HLT	; Stop processing

- 169) Write an Assembly Language Program to take the sum of the 8-bit contents of a memory block stored from 2201H to 220AH. Store the 2-byte result at the locations 220BH and 220CH starting with LOB (Lowers Order Byte). **(July 2017)**

Ans. :

Label	Mnemonics	Comments
	LXI H, 2201H	; Set HL pointer to 2201H
	MOV C, 0AH	; Store count 0A to Reg. C
	MVI A, 00H	; Make LSBs of SUM = 00H
	MOV B, A	; Make MSBs of SUM = 00H
BACK	ADD M	; Add accumulator content with memory

Label	Mnemonics	Comments
LOOP	JNC LOOP	; Jump if no carry jump on LOOP
	INR B	; Increment B reg. content by 1
	INX H	; Increment memory location
	DCR C	; Decrement counter by 1
	JNZ BACK	; Jump if not zero jump on BACK
	STA 220BH	; Store LSBs of the sum to 220BH
	MOV A, B	; Get MSBs of sum in accumulator
	STA 220CH	; Store MSB at 220CH
	HLT	; Stop processing

- 170) Write an Assembly Language Program to count the total number of 0 (Low) bits in an 8-bit number stored at the location 4301H. Store the result (count) at the memory location 4302H. **(July 2017)**

Ans. :

Label	Mnemonics	Comments	
BACK	LXI H, 4301H	; Initialize HL pair with address of number	
	MOV B, M	; Get number in B Reg.	
	MVI C, 00H	; Initialize reg. C to store count of zeros	
	MVI E, 08H	; Initialize reg. E to store count for 8 bit no.	
	MOV A, B	; Transfer 8-bit number into accumulator	
	RLC	; Rotate content of accumulator left side by 1 bit	
	MOV B, A	; Store the rotated data in reg. B	
	JC LOOP	; If carry ? yes jump to LOOP	
	LOOP	INR C	; Increment reg. C content by 1 if there is no carry bit
		DCR E	; Decrement reg. E by 1
JNZ BACK		; Jump if not zero jump to BACK	
MOV A, C		; Get answer i.e. number of zero's to accumulator	
	STA 4302H	; Store the count in 4302H memory location	
	HLT	; Stop processing	

- 171) Write an Assembly Language Program to find the greatest number in a memory block stored from 6201H to 620AH. Store the result at the location 620BH. **(July 2017)**

Ans. :

Label	Mnemonics	Comments
BACK	MVI A, 00H	; Largest = 00H
	MVI C, 0AH	; Set count = 0AH
	LXI H, 6201H	; Set HL pair to 6201H
	CMP M	; Compare with previous no. ? Is it greater
	JNC LOOP	; No larger is in accumulator go to LOOP
LOOP	MOV A, M	; get larger no. in accumulator
	INX H	; Increment next memory location
	DCR C	; Decrement counter
	JNZ BACK	; Repeat if counter \neq 0
	MOV M, A	; Store largest no. in memory location 620BH
	HLT	; Stop processing

- 172) Write an Assembly Language Program to multiply an 8-bit number stored at 4301H by another 8-bit number stored at 4302H. Store the result at the location 4303H and 4304H beginning with LOB (Lower Order Byte) **(March 2018)**

Ans. :

Label	Mnemonics	Comments
BACK :	LXI D, 4301 H	; Load multiplier and multiplicand in L and H
	XCHG	; Place multiplier and multiplicand in E and D
	LXI H, 0000 H	; Clear HL register pair to store 16-bit product
	MOV A, D	; Take multiplier in A
	MVI D, 00 H	; Clear the D register
	DAD	; Add DE pair to HL pair
	DCR A	; Decrement multiplier count
	JNZ BACK	; If counter \neq 0, jump label "BACK"
	SHLD 4303 H	; Store the LOB and HOB of product at 4303H and 4304H
	HLT	; Stop the processing

- 173) Write an Assembly Language program to fill in the memory locations starting from 6900H and onward with the decimal numbers 0 to 99. **(March 2018)**

Ans. :

Label	Mnemonics	Comments
	LXI H, 6900 H	; Initialize the first-memory location
	MVI C, 64 H	; Initialize register C as a location counter
	XRA A	; Clear the accumulator

Label	Mnemonics	Comments
REPEAT	MOV M, A	; Move accumulator contents to memory
	ADI 01 H	; Update the contents of accumulator
	DAA	; Convert binary contents of accumulator into decimal
	INX H	; Get the next memory location
	DCR C	; Decrement location counter by 1
	JNZ REPEAT	; If counter \neq 0 jump to the label "REPEAT"
	HLT	; Stop the process

- 174) Write an Assembly Language Program to take the 2's complement of an 8-bit number stored at 3301H. Store the result at the memory location 3302H.

(March 2018)

Ans. :

Mnemonics	Comments
LXI H, 3301 H	; Point to the given 8-bit no.
MOV A, M	; Copy the number in accumulator
CMA	; Take the 1's complement
ADI 01 H	; Obtain the 2's complement
INX H	; Get the next memory location
MOV M, A	; Place the result in memory
HLT	; Stop the μ p

- 175) Write an Assembly Language Program to count the occurrence of the data byte ACH in a memory block stored from 7401H to 7405H. Store the count at the memory location 7406H.

(March 2018)

Ans. :

Label	Mnemonics	Comments
BACK	LXI H 7401H	; initialize the first memory location
	MVI C, 00 H	; Initialize reg. C as location counter
	MVI B, 00 H	; Initialize reg. B to store occurrence byte counter
	MOV A, M	; Take the mem. Contents to accumulator
	CPI ACH	; Check if accumulator matches the data ACH
SKIP	JNZ SKIP	; If accumulator doesn't contain ACH, jump to skip
	INR B	; Update the value of occurrence counter
	INX H	; Get the next memory location
	DCR C	; Decrement reg. C content by 1
	JNZ BACK	; If counter \neq 0, jump to the label "BACK"
	INX H	; Get the next memory location
	MOV M B	; Place occurrence count by in memory
HLT	; Stop the processing	

176) Write a subroutine in assembly language to fill the memory locations 7301H to 73FFH with the hexadecimal numbers 01H to FFH respectively. **(March 2018)**

Ans :

Label	Mnemonics	Comments
START	LXI H, 7301H	: Point to the first location
	MVIC, FFH	: Initialize reg. C as location counter
	MVI A, 01H	: Initialize reg. A with 01 n content
BACK	MOV M, A	: Copy the accumulator content in memory
	INX H	: Get the next memory location
	INR A	: Increment accumulator contents by 1
	DCR C	: Decrement reg. C counter by 1
	JNZ BACK	: If counter \neq 0, jump to the label "BACK"
	RET	: Return to main program

177) Write an Assembly Language Program to count the total number of even data bytes occurring in a block of data stored from 9201H to 902AH. Store the result (count) at the memory location 9500H. **(March 2018)**

Ans :

Label	Mnemonics	Comments
	LXI H, 9201H	: Initialize the first memory location
	MVIC, 0AH	: Initialize reg. C as location counter
	MVI B, 00H	: Initialize reg. B to store even byte counter
REPEAT	MOV A, M	: Get the memory content in accumulator
	RRC	: Take bit D ₇ of accumulator in C ₇ flag position
	JC NEXT	: If not even jump to the label "NEXT"
	INR B	: Update the value of even byte counter
NEXT	INX H	: Get the next memory location
	DCR C	: Decrement location counter by 1
	JNZ REPEAT	: If counter \neq 0, jump to the label "REPEAT"
	MOV A, B	: copy even byte count value in accumulator
	STA 9500H	: Store even byte count at address 9500H
	HLT	: Stop the processing

178) Write the appropriate comment for the following program as well as its purpose. Note that square decimal number from 0 to 9 are stored in memory location from 1500H to 1509H respectively. The above range (0 to 9) decimal is stored at 1234H. **(July 2018)**

Label	Instruction	Comments
	LDA 1234H	; _____
	MOV L, A	; _____
	MVI H, 15H	; _____
	MOV A, M	; _____
	STA 1235H	; _____
	HLT	; _____

Ans. :

Label	Instruction	Comments
	LDA 1234H	; Load accumulator directly from 1234 H memory location
	MOV L, A	; move the content of Acc to reg. L.
	MVI H, 15H	; move immediate 15H to reg. H
	MOV A, M	; move memory content to accumulator
	STA 1235H	; store accumulator content directly at 1234 H memory location
	HLT	; Stop μ p

Purpose of program to find square of given decimal number.

179) Write an Assembly Language Program to find absolute difference of two hex numbers stored in memory locations 5000H and 5001H. Store the result at 5002 H.

(March 2019)

Ans. :

Label	Mnemonics	Comments
	LXI H, 5000 H	; Set H-L pointer to 5000 H
	MOV A, M	; Move 1 st no. in Accumulator
	INX H	; Increment H-L pair
	SUB M	; Subtract 2 nd no. form 1 st no.
	JP GO	; If positive result, jump to GO
	MOV A, M	; Move 2 nd no. in ACC
	DCX H	; Decrement H-L pair
	SUB M	; Subtract 1 st no. from 2 nd no.
GO	STA 5002 H	; Store result in 5002 H
	HLT	; Stop

- 180) Write an Assembly Language Program to find largest number in a block of memory starting from 7000 H. The length of the block is stored at 6FFF H. Store the result at the end of the block. **(March 2019)**

Ans. :

Label	Mnemonics	Comments
	LXI H, 6FFF H	; Set H-L pair to 6FFF H
	MOV C, M	; Set counter
	MVT A, OOH	; Set largest = 00 H
BACK	INX H	; Increment H-L pair
	CMP M	; Compare no in memory with no in ACC
	JNC AHEAD	; If no in ACC is larger, jump to AHEAD
	MOV A, M	; Move larger no in ACC
AHEAD	DCR C	; Decrement counter
	JNZ BACK	; Repeat if counter≠0
	INX H	; Increment H-L pair
	MOV M, A	; Store largest number at the end of block
	HLT	; Stop

- 181) Study the following program and answer the questions given below : **(March 2019)**

Label	Mnemonics/Operand
	MVI C, 08 H
	LXI H, 6000 H
	MOV A, M
BACK	RRC
	DCRC
	JNZ BACK
	INX H
	MOV M, A
	HLT

- (i) Write the purpose of the program.
 (ii) Write comments for the instructions used in the program.
 (iii) If the input data at memory location 6000 H is FF H, then write the result along with corresponding memory location.

- 182) A block of data is stored in memory locations starting from 3001 H. The length of the block is at 3000 H. Write an Assembly Language Program that searches for the first occurrence of data AO H in given block. Store the address of this occurrence in HL pair. If the number is not found then HL pair should contain 0000 H. **(March 2019)**

Ans. :

Label	Mnemonics	Comments
	LXI H, 3000 H	; Set H-L pair to 3000 H
	MOV C, M	; Set counter
	MVI A, AO H	; Move AO H to ACC
BACK	INX H	; Increment H-L pair
	CMP M	; Check if memory contains AO H
	JZ END	; If yes, then found
	DCR C	; Decrement counter
	JNZ BACK	; Repeat if counter # 0
	LXI H, 0000 H	; Set H-L pair to 0000 H
END	HLT	; Stop

183) Write a Assembly Language Program to find sum of ten hex numbers stored in consecutive memory locations starting from 4000 H. Store the two byte result at the end of the block beginning with lower byte. **(March 2019)**

Ans. :

Label	Mnemonics	Comments
	MVIC, OAH	; Set counter to OAH
	MVI A, OOH	; Initialise ACC
	MOV B, A	; Initialise reg. B
BACK	LXI H, 4000 H	; Set H-L pair to 4000 H
	ADD M	; Add contents of memory with ACC
	JNC AHEAD	; If no carry, jump AHEAD
	INR B	; Add carry to MSB of sum
AHEAD	INX H	; Increment H-L pair
	DCR C	; Decrement counter
	JNZ BACK	; Repeat if counter # 0
	MOV M, A	; Store LSB of Sum
	INX H	; Increment H-L pair
	MOV A, B	; Move contents of B to accumulator
	MOV M, A	; Store MSB of Sum
	HLT	; Stop

184) Study the following program and answer the questions given below : **March 2019**

Label	Mnemonics/Operand
	LXI H, C000 H
	MOV C, M
BACK	INX H
	MOV A, M
	XRA A
	MOV M, A
	DCR C
	JNZ BACK
	HLT

- Write the purpose of the program.
- Write comments for the instructions used in the program.
- If the input data at memory location C000 H is 05 H, then write the result along with corresponding memory location.

Ans. :

- Clear the memory location fill counter not zero OR make the memory location with zero data.

(ii)

Label	Mnemonics/Operand	
	LXI H, C000 H	; Load in mm HL reg. with C000H memory location
	MOV C, M	; move the content of memory location to C reg.
BACK	INX H	; Increment HL reg pair by 1 memory location
	MOV A, M	; move the content of memory location to accumulator
	XRA A	; Exclusive OR the content of accumulator
	MOV M, A	; move the content of accumulator to memory location.
	DCR C	; Decrement content of C reg by 1 memory location
	JNZ BACK	; jump if not zero jump on BACK
	HLT	; Stop µp

(iii) If C000 H = 05 H then

after execution C001 H = 00 H
 C002 H = 00 H
 C003 H = 00 H
 C004 H = 00 H
 C005 H = 00 H

- 185) Accumulator contain data FFH and register B contain data 02H. Write the status of various flags and content of accumulator after execution of ADD B instruction.

(July 2019)

Ans. :

$$\text{ACC} = \text{FFH} = 1111 \quad 1111$$

$$\text{B} = 02\text{H} = 0000 \quad 0000$$

$$\begin{array}{r} 1111 \quad 1111 \\ + \quad 0000 \quad 0010 \\ \hline \text{After ADD Bcy} \quad \boxed{1} \quad 1111 \quad 11 \end{array}$$

$$0000 \quad 0001$$

After exec. ACC = 01

S = 0, Z = 0, AC = 1, P = 0, Cy = 1

- 186) The flag register of 8085 microprocessor contain data 55H. Interpret its meaning.

(July 2019)

Ans. :

Flag Reg. = 55 H
= 0101 0101

D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	1	0	1	0	1	0	1
S	Z	X	AC	X	P	X	Cy

S = 0 = Reset = Accumulator content is positive no.

Z = 1 = Set = Accumulator content result is zero

AC = 1 = Set = In accumulator content carry is generated from D_3 to D_4

P = 1 = Set = In accumulator content even no. of 1's present

Cy = 1 = Set = There is carry or borrow generated in accumulator content

- 187) Accumulator contain data ABH and register B contain data 55H. What will be the contents of accumulator after execution of each following instruction independently?

(i) XRA B (ii) CMP B

(iii) ADD B (iv) CMA

 $A_{CC} = AB_H = 1010 \quad 1011$

Reg B = 55H = 0101 0101

Ans. :

- (i) XRA B : Logically X-OR with accumulator
1010 1011
0101 1110 = FE_H

After execution XRA B Acc. content = FE_H

- (ii) CMP B : Compare Reg. B with accumulator.

A = 1010 1011 and B = 0101 0101

While comparing accumulator remains unchanged. Hence A = ABH.

(iii) ADD B : Add Reg. B with accumulator.

A = 1010 1011

B = 0101 0101

1 1111 111

Cy 0000 0000 = 00H

∴ After execution ADD B Acc. content = 00H and Cy flag = 01H.

(iv) CMA : Complement content of Accumulator.

A = 1010 1011

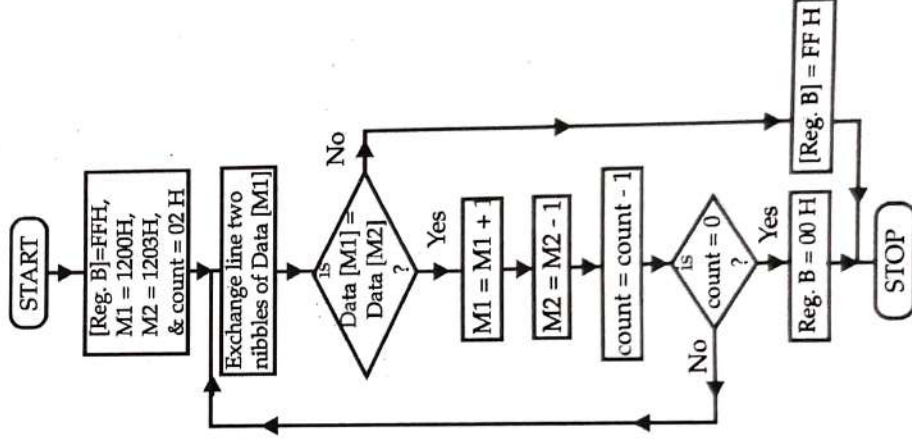
1's complement 0101 0100 = 54H

∴ After execution CMA Acc. content = 54H

188) Write an Assembly Language Program to check whether the given 16 bit number stored in consecutive memory location beginning with lower byte 1200H is palindrome or not. If the number is palindrome then store FFH at 1210H memory location otherwise store 00H at same memory location. **(July 2019)**

Ans.:

Flowchart:



Assembly language program :

Memory address	Label	Mnemonics	Comments
C000		LXI H, 1200 H	; Set H-L pair to 1200H
C003		LXI D, 1203H	; Set D-E pair to 1203H
C006		MVI C, 02H	; Set count = 02H
C008	Loop	MOV A, M	; take [[H-L]] in accumulator
C009		RRC	; with 4 RRC
C01A		RRC	; exchange the
C00B		RRC	; two nibbles of
C00C		RRC	; no. in accumulator
C00D		XCHG	; Exchange [H-L] & [D-E]
C00E		CMP M	; is [Acc.] = [[H-L]] ?
C00F		JNZ Escape	; escape if [Acc.] ≠ [[H-L]]
C012		XCHG	; Reexchange [HL] & [DE] pairs
C013		INX H	; [H-L] = [H-L] + 1
C014		DCX D	; [D-E] = [D-E] - 1
C015		DCR C	; count = count - 1
C016		JNZ Loop	; Repeatif count ≠ 0
C019		LXI H, 1210H	
C01B		MVI B, FFH	
		JMP STP	; Set [Reg. B] = 00 if No. is palindrome.
C01E	Escape	LXI H, 1210H	
C020	STP	MVI B, 00H	; Number is not palindrome
		HLT	; stop

189) Study the given program and answer the questions given below :

(July 2019)

Label	Mnemonics/Operand
	MVI B, 0A H
	LXI H, 2000 H
	MVI A, 01H
	MOV M, A
	INX H
	DCR B
	JZ stop
	ADI 02H
	JMP loop
stop	HLT

- (i) Write the purpose of the program.
 (ii) Write comments for each instructions used in the program.
 (iii) Write the result along with their corresponding memory locations.

Ans. :

(i) Purpose of program to store ten add no. in series.

(ii)

	MVI B, 0AH	; initialize 0AH data to reg. B
	LXI H, 2000H	; Load HL reg. Pair with 2000H m.L.
	MVI A, 01H	; initialize 01H data to reg. A
loop	MOV M, A	; move reg. A data to memory
	INX H	; Increment HL reg. pair by 1 m.L.
	DCR B	; Decrement reg. B content by 1
	JZ Stop	; Jump if zero jump on specify label
	AD1 02H	; Add immediate 02H data with accumulator
	JMP loop	; Jump unconditionally to specify label
Stop	HLT	; Stop

(iii)

2000 = 01H 2005 = 0BH
 2001 = 03H 2006 = 0DH
 2002 = 05H 2007 = 0FH
 2003 = 07H 2008 = 11H
 2004 = 09H 2009 = 13H

- 190) Write an Assembly Language Program for 8 bit number stored in memory location BABAH. Separate the two nibbles and multiply it. Store the result in memory location DADAH. **(July 2019)**

Ans. :

LXI H, BABAH	; Load HL reg. pair with BABAH m.L.
MOV A, M	; move memory content to reg. A.
ANI 0FH	; Logically AND 0FH with accumulator
MOV B, A	; move reg. A data to reg. B
MOV A, M	; move memory content to accumulator
ANI F0H	; Logically AND F0H with accumulator
RRC	; Rotate accumulator right by 1 bit
RRC	; Rotate accumulator right by 1 bit
RRC	; Rotate accumulator right by 1 bit

RRC	; Rotate accumulator right by 1 bit
MOV C, A	; move reg. A data to reg. C
INX H	; Increment HL reg. pair by 1
MOV M, B	; move reg. B data to memory
INX H	; Increment HL reg. pair by 1
MOV M, C	; move reg. C data to memory
SUB A	; clear accumulator
ADD B	; Add reg. B data with accumulator
DCR C	; Decrement Reg. C data by 1
JNZ	; Jump if not zero jump on specify label
STA DAD A	; Store accumulator data to DAD AH m.L.
HLT	; Stop

- 191) Write an Assembly Language Program to find the sum of series. Length of series is stored in memory location 1500H and series begins from memory location 1501H. Store the 16 bit sum from memory location 1600 H beginning with lower order byte. **(July 2019)**

Ans.:

LXI H, 1500H	; Load HL reg. pair with 1500H m.L.
MOV C, M	; move memory content to reg. C
SUB A	; subtract accumulator content from itself
MOV B, A	; move reg. A data to reg. B
INX H	; Increment HL reg. pair by 1
ADD m	; Add memory content with accumulator
INC label	; Jump if no carry jump on label
INR B	; Increment reg. B content by 1
DCR C	; Decrement reg. C content by 1
JNZ	; Jump if not zero jump on specify sign
STA 1600H	; Store accumulator content at 1600H m.L.
MOV A, B	; move reg. B data to reg. A
STA 1601H	; Store accumulator content to 1601H m.L.
HLT	; Stop

- 192) Study the given program and answer the questions given below :

STC
CMC
LXI B, 1234H
MOV A, B
RAR

```
MOV H, A
MOV A, C
RAR
MOV L, A
HLT
```

- (i) Write the purpose of the program. 2
- (ii) Write contents of various registers used. 2
- (iii) Write comments of various instructions used in the program. 1

Ans. :

- (i) Rotate reg. pair content by 1 time.
- (ii) Cy = 0
 B = 12 After RAR on it H = 09
 C = 34 After RAR on it L = 1A
 A = 1A
 ∴ Reg. B = 12, Reg. H = 09, Reg. A = 1A
 Reg. C = 34 Reg. L = 1A

(iii)

STC	; Set carry flag
CMC	; Complement carry flag
LXI B, 1234 H	; Load BC reg. pair with 1234H m.L.
MOV A, B	; move B reg. data to reg. A
RAR	; Rotate accumulator content right by 1
MOV H, A	; move accumulator dat to reg. H
MOV A, C	; move reg. C content to accumulator
RAR	; Rotate accumulator content right by 1
MOV L, A	; move accumulator data to reg. L
HLT	; Stop

193) Flag register contain data C5H interpret its meaning.

(March 2020)

Ans. : C5 = 1100 0101

D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
1	1	0	0	0	1	0	1
S	Z	X	AC	X	P	X	Cy

S = 1 = Set = Accumulator content is negative no.

- Z = 1 = Set = Accumulator content means result is zero
- AC = a = reset = In accumulator content carry is not generated from D₃ to D₄
- P = 1 = Set = In accumulator content even no. of 1's present
- Cy = 1 = Set = There is carry or borrow generated in accumulator content

194) The accumulator contain data 58H and register B contain data 07H. What will be the content of Accumulator after execution of following instruction independently :

- (i) ADD B (ii) ORA B (iii) ANA B

(March 2020)

Ans. :

ACC = 58H = 0101 1000

Reg. B = 07H = 0000 0111

(i) ADD B

A = 58 H = 0101 1000

B = 07 H = 0000 0111

$$\begin{array}{r} \text{Additional Operation} = \\ \hline 0101 \quad 1111 \\ \hline 5 \quad \quad F \end{array}$$

∴ ADD B = 5FH Accumulator content

(ii) ORA B

A = 58 H = 0101 1000

B = 07 H = 0000 0111

$$\begin{array}{r} \text{Logical OR Operation} = \\ \hline 0101 \quad 1111 \\ \hline 5 \quad \quad F \end{array}$$

∴ ORA B = 5FH Accumulator content

(iii) ANA B

A = 58 H = 0101 1000

B = 07 H = 0000 0111

$$\begin{array}{r} \text{Logical AND Operation} = \\ \hline 0000 \quad 0000 \\ \hline 0 \quad \quad 0 \end{array}$$

∴ ANA B = 00H Accumulator content

195) A block of data is stored from memory location D001H. Length of block is stored at D000H. Write a program to find occurrences of data 02H in given block. Store the number of occurrences at Memory Location D100H.

(March 2020)

Ans. :

LXI H, D000H	; Load HL seg. Pair with D000H
MOV B, M	; move memory content to reg. B
MVI A, 02H	; move immediate 02 to reg. A
MVI C, 00H	; move immediate 01 to reg. B
INX H	; Increment HL reg. pair by 1
CMP M	; compare memory content with OC
JNZ X	; Jump if not zero jump on specific label
INR C	; Increment, c reg. content by 1

X DCR B	; Decreased B reg. content by 1
JNZ	; Jump if net zero jump to specify label
MOV A, C	; move reg. c content acc
STA D100H	; store directly acc. Content to D001H
HLT	; stop up

- 196) A block of data is stored from memory location D001H to D005H. copy the contents of block to another block starting from 2501H. **(March 2020)**

Ans. :

LXI H, D001H	; load HL reg. pair with D001H
LXI B, 2501H	; load BC reg. pair with 2501H
MVI D, 05H	; move 05 data to reg. D
X MOV A, M	; move memory content to acc.
SATX B	; store BC reg. pair content to acc.
INX H	; Increment HL reg. pair by 1
INX B	; Increment BC reg. pair by 1
DCR D	; Decrement D reg. content by 1
JNZ X	; Jump if not zero to specify label
HLT	; Stop up

- 197) Write a program to subtract 3 Byte integer in register EHL from another 3 Byte integer in BCD. The result should be placed in BCD register keeping the integers in EHL undisturbed. **(March 2020)**

Ans. :

STC	; set carry flag
cmc	; complement carry flag
MOV A, D	; move reg. D content to acc.
SUB L	; subtract reg. L content from acc. coil
MOV D, A	; move reg. A content to reg. D
MOV A, C	; move reg. C content to reg. A
SBB H	; subtract H reg. with borrow from acc.
MOV C, A	; move reg. A content to reg. C
MOV A, B	; move reg. B content to reg. A
SBBE	; subtract E reg. with borrow from acc.
MOV B, A	; move reg. A content to reg. B
HLT	; stop up

- 198) A block of data is stored in memory location from 3330H. Length of block is stored at 2FFFH. Write a program to find 2's complement of each data in a block and store the result from memory location 4100H.

(March 2020)

Ans. :

LXI D, 4100 H	; load DE reg. pair with 4100 H m.L.
LXI H, 2FFFH	; load HL reg. pair with 2FFFH m.L.
MOV C, m	; move memory content to reg. C.
INX H	; Increment HL reg. pair by 1 m.L.
MOV A, m	; move memory content to accumulator
CMA	; complement accumulator content
INR A	; Increment reg. A content by 1
STAX D	; Store acc. Content to DE reg.
INX H	; Increment HL reg. pair by 1 m.L.
INX D	; Increment DE reg. pair by 1 m.L.
DCR C	; Decrement C reg. content by 1.
JNZ	Jump if not zero jump to specify
HLT	Stop up

- 199) A block of data is stored from memory location C001H and length is stored in C000H. Write a program to find the sum of series and store the sum in C050H and C051H.

(March 2020)

Ans. :

MVI A, 00H	; move 00H data to reg. A
MVI B 00H	; move 00H data to reg. B
LXI H, C000H	; Load HL reg. pair to C000H
MOV C, M	; move memory content to reg. C
INX H	; Increment HL reg. by 1
ADD m	; Add memory content with acc content
JNC	; Jump if not carry jump to specific label
INR B	; Increment reg. B content by 1
INX H	; Increment HL reg. pair by 1 m.L.
DCR C	; Decrement reg. C content by 1
JNZ	; Jump if not zero jump on specific label
STA C050H	; Store acc. Content at label content
MOV A, B	; move reg. B content to reg. A
STA C051H	; Store acc. Content to C051 m.L.
HLT	; Stop up

- 200) Write a program that divides two 1 byte hex number where the dividend is stored in 4060H and divisor in 406H stored the quotient and remainder in next two consecutive memory location respectively. **(March 2020)**

Ans. :

MVI B, 00H	; move 00H data to reg. B
LXI H, 4060H	; load HL reg. pair with 4060 m L.
MOV A, M	; move memory content to acc.
INX H	; Increment HL reg. pair by 1
CMP M	; compare memory content with acc.
JNC	; Jump if carry jump on specify
SUB M	; subtract memory content from acc. content
INR B	; Increment B reg. content by 1
JMP	; Jump unconditional to specify
INX H	; Increment HL reg. pair to
MOV M, B	; move reg. B content to
INX H	; Increment HL reg. pair by
MOV M, A	; move reg. A content to acc.
HLT	; Stop up

□□□

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