Experiment No. 5

1.0 Title :

Binary division.

2.0 Prior Concepts :

2.1 Architecture of 8085 microprocessor.

2.2 Addressing modes of 8085 microprocessor.

2.3 Instruction set of 8085 microprocessor.

3.0 New concepts :

Proposition 1 :

In 8085 binary division is performed by successive subtraction. Divisor is subtracted from dividend till the carry (borrow) flag is set.(i.e. until Dividend < divisor)

Proposition 2 :

In 8085 carry flag is treated as borrow flag for subtraction operation.

4.0 Learning Objectives :

Intellectual skills & Motor skills:

a. Analyze the program statement.

b. Develop algorithm.

c. Write an assembly language program and hand assemble the program.

d. Enter machine code (Hexadecimal code) of program in user RAM.

e. Enter data and execute the program

5.0 Equipment :

The 8085-microprocessor kit along its power supply unit.

6.0 Stepwise procedure :

6.1 Program for binary division (successive subtraction method)

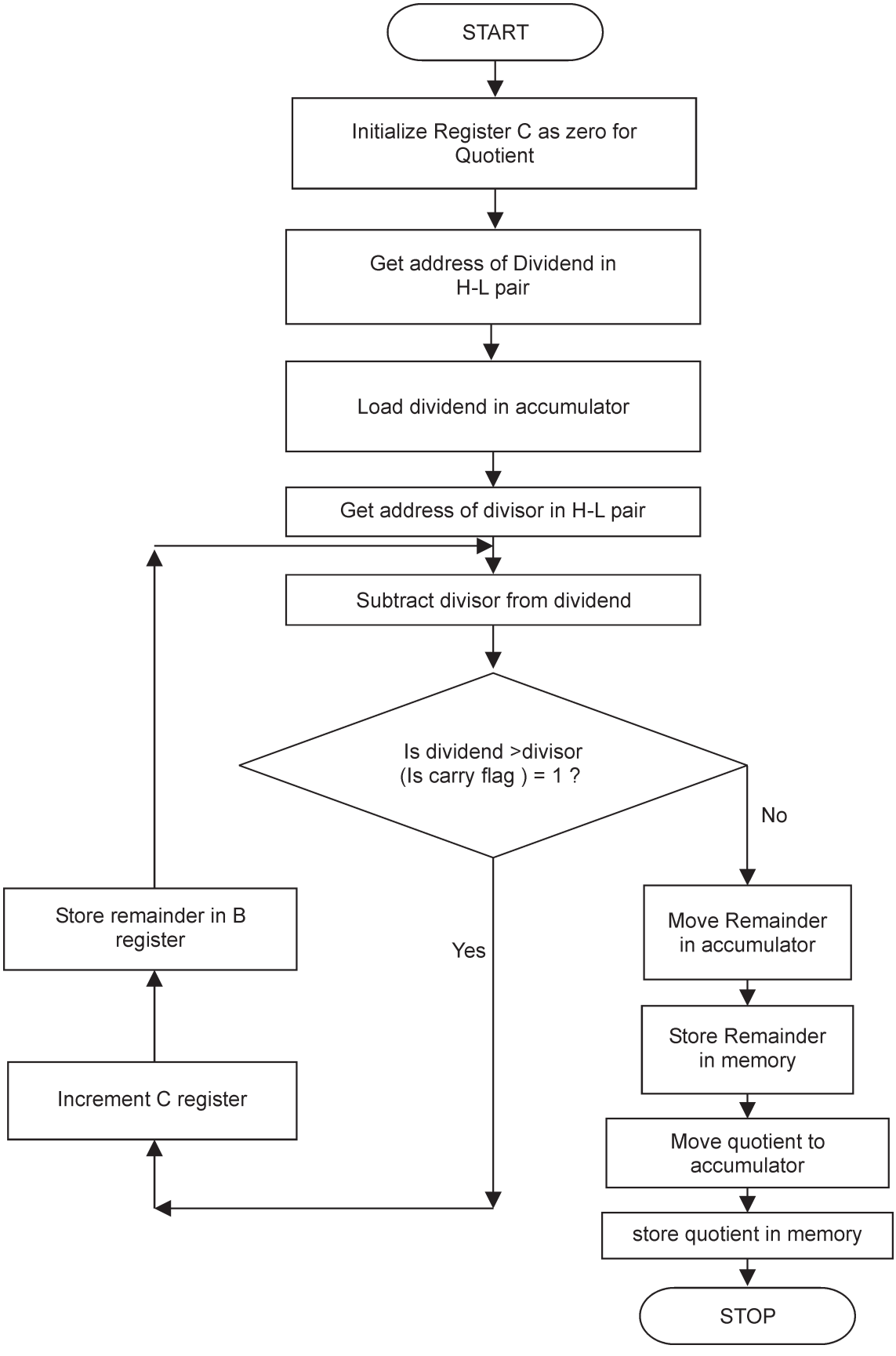
6.1.1 Program statement:

Dividend is stored at memory location 20C2 H. The Divisor is stored at memory location 20C3 H. Store the Quotient at 20C0 H and Remainder at memory location 20C1 H.

6.1.2 Algorithm:

1. Initialize the C register with 00H as a counter for Quotient.
2. Get dividend in Accumulator from memory.
3. Get the address of divisor.
4. Subtract the divisor from dividend.
5. If dividend is greater than divisor, Increment register C
6. Store remainder in register B for result, and repeat step 4 .
7. Otherwise store the contents of accumulator as Remainder in memory location.
8. Store the content of C register as Quotient in memory.

6.1.3 Flowchart:



6.1.4 Assembly Language Program :

Memory Address	Machine code	Label	Mnemonics	Operand	Comments
			MVI	C, 00	; Initialize C register for quotient
			LXI	H,20C2	; Get address of dividend in H-L pair
			MOV	A, M	;Load dividend in accumulator
			INX	H	; Get address of divisor in H-L pair
		AGAIN:	SUB	M	; Subtract divisor from dividend
			JC	NEXT	; Is dividend < divisor?
			INR	C	; No, increment quotient
			MOV	B, A	; Store remainder in b register
			JMP	AGAIN	; Jump to label “Again”
		NEXT:	MOV	A, B	; Yes, Move remainder in accumulator
			STA	20C1	; Store remainder in memory
			MOV	A, C	; Move quotient in accumulator
			STA	20C0	; Store quotient in memory
			HLT		; Stop program execution

7.0 Result :

	Memory Location	Content		
		I	II	III
Result	20C2 (Dividend)			
	20C3 (Divisor)			
Data	20C0 (Quotient)			
	20C1 (Remainder)			

Dated signature of subject teacher

8.0 Questions :

(Note :- Student to answer Q ……. , Q ……. , Q ……. And the question numbers shall be allotted by the teacher.)

8.1 Describe all rotate instructions used in 8085 microprocessor.

8.2 Write an Assembly Language Program for division using bit shifting method.

8.3 Write an Assembly Language Program for division of even number using only rotate instruction.

8.4 State the meaning of shifting right by 1 bit and shifting left by 1 bit position.

8.5 If the content of accumulator is shifted 8 times, What will be the content of accumulator.

8.6 How to confirm whether the given number is even or odd?

(Space for Answers)

Space for Answers

Date :-

Signature of Subject Teacher