

1) Write an assembly language routine that returns only after any of the four push buttons on the 8052 educational board is pressed.

2a) Write an assembly language routine that rotates left the values in all 8 registers R0-R7. That is R0 gets the 8-bit value from R1, R1 gets the value from R2, ..., R7 gets the value from R0.

2b) Calculate how many cycles the subroutine takes (including starting the subroutine with ACALL and returning with RET)

2c) Calculate the clock time in seconds to run your subroutine.

3) Assume the Stack Pointer (SP) starts at the default location of 07h. Give the value of SP in hex after each line of the following program. For lines calling a subroutine, show the SP's value while the subroutine is executing and after the subroutine has returned by executing RET.

Program	SP (hex)	
MOV A, #00h		
PUSH 00h		
PUSH 01h		
PUSH 02h		
PUSH 03h		
CALL FlashLEDSub		
CALL DelaySub		
POP 03h		
POP 02h		
POP 01h		
POP 00h		

4a) Using immediate addressing, copy the decimal value 45 to the accumulator.

4b) Using direct addressing, copy the value from memory address 45h to the accumulator.

4c) Using indirect addressing, copy the value from memory address 45h to the accumulator.

4d) Assume you are using an 8052. Using direct addressing, copy the value from memory address 90h (not the P1 SFR) to the accumulator.

4e) Assume you are using an 8052. Using indirect addressing, copy the value from memory address 90h (not the P1 SFR) to the accumulator.