CpE213 Assignment 8
Due at 3pm on Friday Oct. 28

1. Answer the following questions for the ASM program, <u>hw8_question1.asm</u> (posted on Blackboard). Please compile and use the Keil debugger where appropriate.

    a. Where does the variable "lookup" end up being placed in memory? When you look at the code space, can you see the opcodes for the rest of the program there too (i.e. by looking at a memory window)?

    b. At what address does the program start? Why that particular address?

    c. What is the address of variable "mybitvar"?

    d. What is the end result of executing the following instructions? (i.e. what registers/memory locations have changed? What value did they take on? How did this happen?)

```
mov mybyte,#42H    ; intialize mybyte with 42H
mov A, mybyte      ; load A with contents of mybyte
mov R0,#mybyte     ; mov address of mybyte into R0
mov @R0, #0FFH     ; mov FF into location pointed to by R0
xch A,mybyte ; exchange bytes
```

    e. What is the end result of executing these instructions? Explain how this happened.

```
mov SP,#mystack    ; initialize SP
push mybyte        ; push mybyte onto stack
mov A, mystack+1   ; assembler incs addr of mystack by 1
```

    f. For the instructions above, what is the purpose of including the instruction "mov SP,#mystack"?

    g. What is the end result of executing the following instructions? What is the relationship between PSW.7, CY, and 0D0H?

```
setb PSW.7   ; set carry flag
clr CY       ; clear carry flag
setb 0D0H.7  ; set carry flag
```

    h. What values are on the stack when the code executes the instruction "blah: MOV A, #01111111B"? Explain the source of each of these values.

2. For the waveforms in Figure 1, which of the instructions below was read from code memory and executed? Justify your answer.

(a) XRL A,@R1
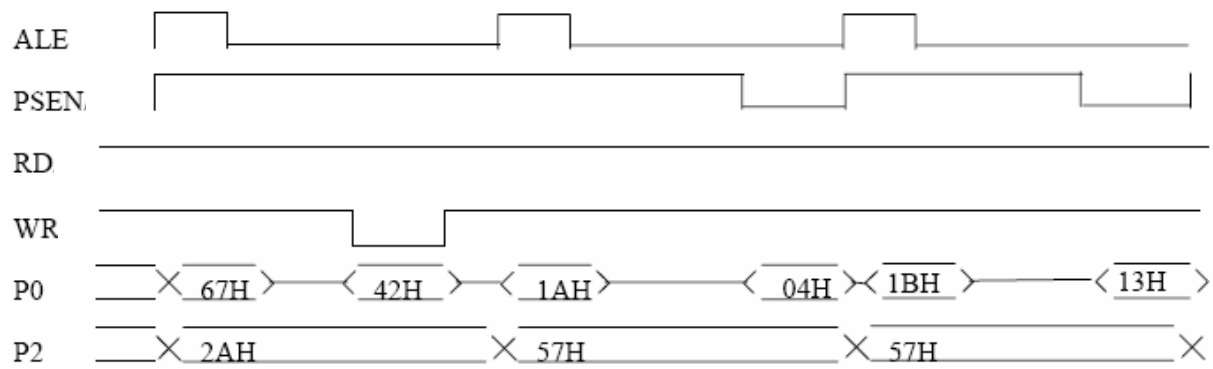(b) DEC R2
(c) INC A
(d) ORL 04H,A
(e) RRC A

Figure 1. Timing Diagram

3. Figure 2 depicts the connection of bit 2 of Port 1 (P1.2) to two external devices. Assume we write a "1" to P1.2 and transistor B is OFF and transistor C is ON. If we perform a MOV C, P1.2 instruction, which of the answers below correctly provides and justifies the resulting value of C? Explain your answer in the simplest language possible.

(a) C=0, because transistor B is off.
(b) C=0, because transistor C is on.
(c) C=1, because transistor B is off.
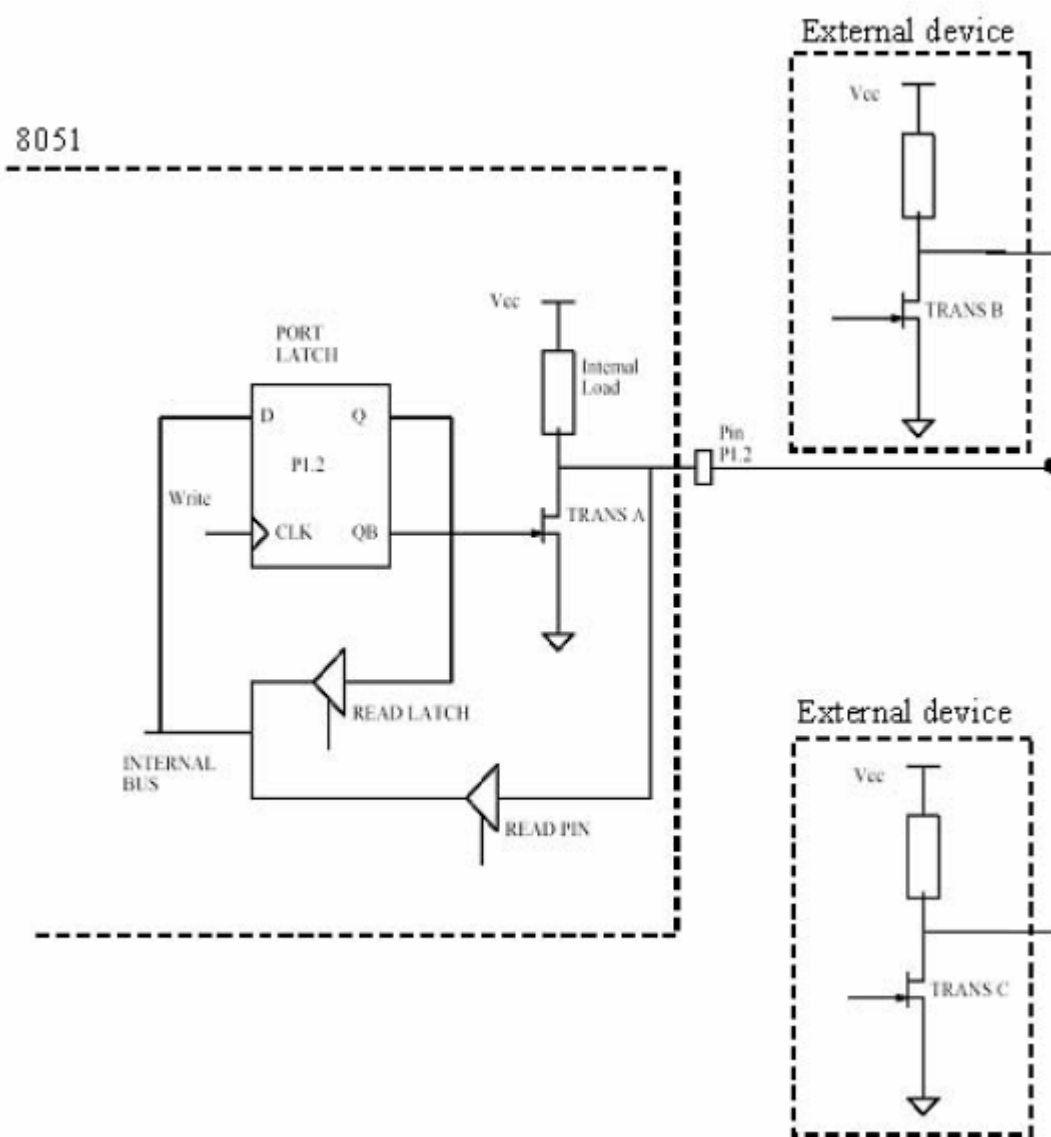(d) C=1, because transistor C is on.
(e) C=1, because we wrote a 1 to P1.2.

Figure 2. Bit 2 of Port 1