

Answer each of the following questions (you can use a calculator)

- a. Assume a PIC is drawing 15 mA current at 5 V, 40 MHz. What would be the expected current draw if the frequency/voltage is reduced to 4 V/ 20 MHz?

$$I_{dd} \sim V_{dd} * V_{dd} * F * C$$

$$C = I_{dd} / (V_{dd} * V_{dd} * F) = 15 \text{ mA} / (5 * 5 * 40 \text{ Mhz}).$$

2nd data point:

$$I_{dd} = 4 * 4 * 20 \text{ MHz} [15 \text{ mA} / (5 * 5 * 40) = 15 \text{ mA} (8/25) = 4.8 \text{ mA}$$

- b. Write C code that puts the PIC to sleep.

asm ("SLEEP") --- assembly language instruction

- c. Explain the FUNCTIONAL difference between a watchdog-timer WAKEUP and a WATCHDOG timer RESET. When does one OCCUR versus the other? What is the difference in terms of the next instruction that is executed?

WDT Wakeup – happens when PIC is asleep and WDT expires. Next instruction after SLEEP instruction is executed.

WDT Reset – happens when the PIC is in normal execution, and the WDT expires. This forces a reset, which means the next instruction executed is at location 0x0000.