PROBLEM:-

We use a crystal XTAL = 11.0592 MHz. What value do we need to load the timer's register if we want to have a time delay of 50 ms (milliseconds)? Show the program for timer 0 to create a pulse width of 50 ms .

Solution:-

The timer works with a clock frequency of 1/12 of the XTAL frequency; therefore, we have 11.0592 MHz/ 12 =921.6 kHz as the timer frequency. As a result, each clock has a period of T= 1/921.6 kHz = 1.085 uS. In other words, Timer 0 counts up each 1.085 uS. Resulting in delay= number of counts x 1.085 uS.

Since XTAL 11.0592 MHz, the counter counts up every 1.085 us. This means that out of many 1.085 us intervals we must make a 50 ms pulse. To get that, we divide one by the other. We need 50 ms/1.085 us 46083 clocks. To Achieve that we need to load into TL and TH the value 65536-46083=0x4BFD [19,453]. Therefore, we have TH=4B and TL=FD.

Max delay using timers0/1 in mode 1 is 71.106ms.

Step of Programming of timers / counters declaration:-

S1-> Initialize TMOD register to select particular mode of timer/counter operation.

S2->Initialize TL0/TL1 and TH0/TH1 to select particular initial value of timer/counter.

S3-> Start timer/counter using TR0/TR1.

S4->Check if the timer/counter is overflow TF0/TF1.

S5->Stop the timer/counter using TR0/TR1.

S6-> Clear over flag for next operation TF0/TF1.