

Quiz 2 Solution

رقم الشعبة: 2

رقم التسجيل:

الاسم:

Instructions: Time **10** minutes. Closed books and notes. No calculators. Please answer all problems in the space provided. **No questions are allowed.**

<Good Luck>

Q1. Assuming that the PIC 16F84A operates on a processor clock of 4 MHz, write a 1-ms delay subroutine.

Instruction clock = 4 MHz / 4 = 1 MHz

Instruction cycle = 1 / 1 MHz = 1 μ s

1 ms / 1 μ s = 1000 cycles

A loop of 5 cycles should be executed 1000/5 = 200 iterations. Therefore the subroutine is:

```
Delay movlw  D'200'
      movwf  delcntrl      ;initialize delcntrl for 200 iterations
Loop  nop
      nop
      decfsz delcntrl,1    ;skip next instructions after 200 iter.
      goto  Loop
      return
```

Q2. Assume that the external interrupt of the PIC 16F84A is enabled. Write an interrupt service routine that writes 0xFF to Port B when this interrupt occurs. The Register INTCON (at address 0bh) is shown below.

R/W-0	R/W-x						
GIE	EEIE	TOIE	INTE	RBIE	TOIF	INTF	RBIF
bit 7							bit 0

Int_Routine

```
movwf w_temp      ;Copy W to W_TEMP register

movlw Off
movwf portb      ;Write 0xff to Port B (addr 06)

swapf w_temp,1   ;Swap nibbles in W_TEMP
swapf w_temp,0   ;Swap nibbles in W_TEMP into W

bcf  intcon,intf ;Clear the external interrupt flag
retfie
```