

Course name: Practical App. CS II
 Course Code: -
 Lecturer: Dr. Ahmed ElShafee

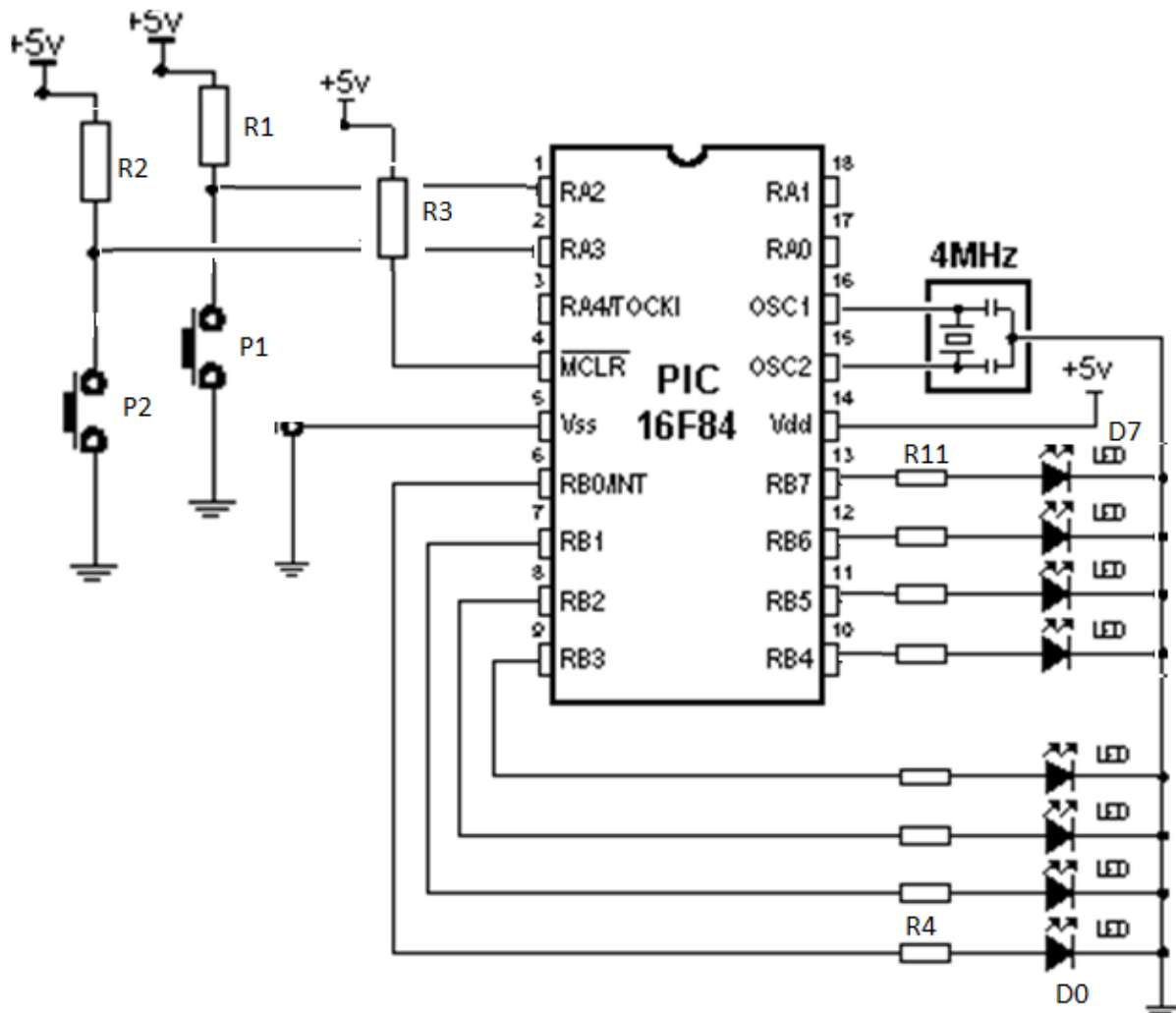
Exam number: Midterm2, model answer
 Exam Date: 26/05/2013
 Time Allowed: 60 minutes

Name: _____

ID: _____

[1]	[2]	[3]	[4]	Total
/5	/5	/2.5	/7.5	/20

[1] for the following schematic PIC16f84A microcontroller, write an assembly program that make leds (D0 →D7) counts up when pressing P1, and counts down when pressing P2





Complete the following code with “up”, and “down” macros

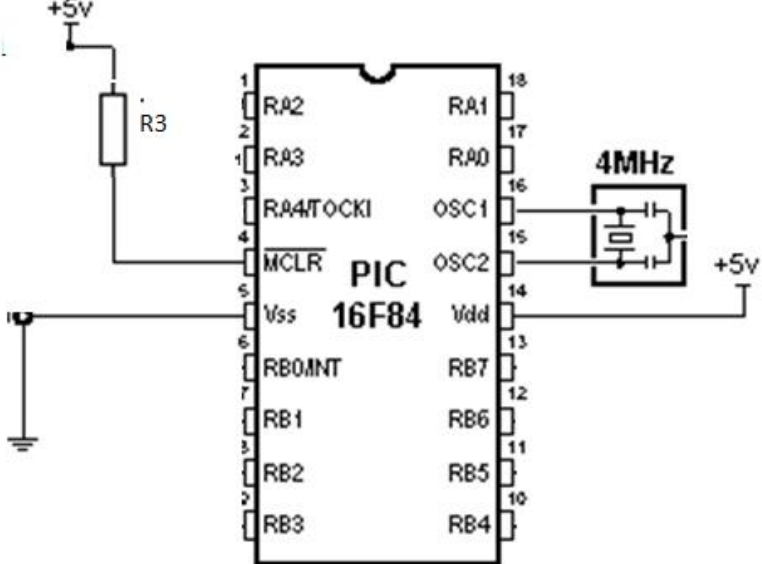
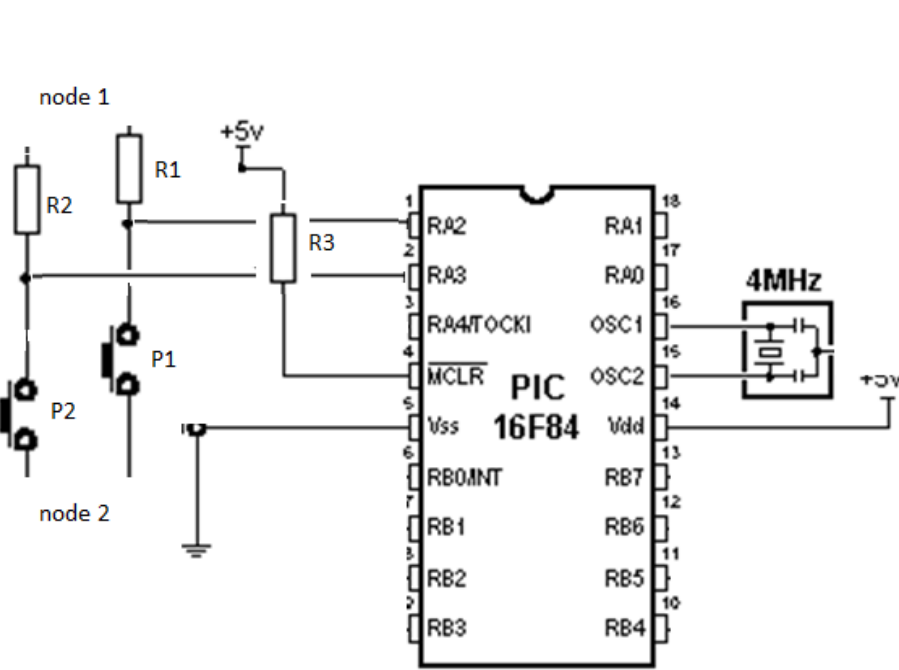
```
.ORG 000
    GOTO start
.org 004
    GOTO start
DELAY1S:
    MOVLW 0X05
    MOVWF 0X0E
DELAY1S_WAIT1:
    MOVLW 0XFF
    MOVWF 0X0D
DELAY1S_WAIT2:
    MOVLW 0XFF
    MOVWF 0X0C
DELAY1S_WAIT3:
    DECFSZ 0X0C,F
    GOTO DELAY1S_WAIT3
    DECFSZ 0X0D,F
    GOTO DELAY1S_WAIT2
    DECFSZ 0X0E,F
    GOTO DELAY1S_WAIT3
    RETURN
start:
    Bsf STATUS, RP0
    movlw b'00000000'
    movwf TRISB
    movlw b'11111111'
    movwf TRISA
    Bcf STATUS, RP0
    Movlw 0X00
    Movwf 0x0f
Loop:
    btfss porta,2
    call up
    btfss porta,3
    call down
    call DELAY1S
    goto loop
up:
    .....
    .....
    Return
down:
    .....
    .....

return
```



```
up:
    incf 0x10,1
    movf 0x10,w
    movwf portb
    return
down:
    decf 0x10,1
    movf 0x10,w
    movwf portb
    return
```

[2] complete the following table

Q	Answer
Value of R1, R2	10K
R3	10K
R4 → R11	100 ohm
Add a press (P3) to act as hard reset for microcontroller	 <p>The diagram shows a PIC 16F84 microcontroller. The MCLR pin (pin 4) is connected to a +5V supply through a resistor labeled R3. A push-button switch is connected between the MCLR pin and ground. The oscillator circuit consists of a 4MHz crystal connected to pins OSC1 (pin 16) and OSC2 (pin 15), with a +5V supply connected to pin VDD (pin 14). Other pins are labeled: RA2, RA3, RA4/T0CKI, RA1, RA0, RB0-MT, RB1, RB2, RB3, RB4, RB5, RB6, RB7, VSS (pin 5), and VDD (pin 14).</p>
Reconnect press P1, and P2 to change its configuration from active low to active high or from active high to active low	 <p>The diagram shows a PIC 16F84 microcontroller. The RA2 pin (pin 1) is connected to a +5V supply through resistor R2 and to a push-button P1 through resistor R1. The RA3 pin (pin 2) is connected to a +5V supply through resistor R3 and to a push-button P2 through resistor R1. The oscillator circuit is identical to the previous diagram, with a 4MHz crystal connected to pins OSC1 (pin 16) and OSC2 (pin 15), and a +5V supply connected to pin VDD (pin 14). Other pins are labeled: RA1, RA0, RB0-MT, RB1, RB2, RB3, RB4, RB5, RB6, RB7, VSS (pin 5), and VDD (pin 14).</p>

[3] we need to connect an AC lamp to pin 13 of the following arduino microcontroller.

3.1 state the required components

#	Component name	Value
1	Power socket	
2	Relay 12V	
3	R = 100ohm	
4	4N35	

3.2 draw the interface connection.

