

**EE 308 – Homework 10**

For all problems below assume you are using a MCS12DP256 chip with a 24 MHz bus clock and a 8 MHz oscillator clock.

1. The Microchip MCP23016 provides 16 general purpose I/O lines over the IIC bus. Download the MCP23016 datasheet:

<http://ww1.microchip.com/downloads/en/DeviceDoc/20090C.pdf>

- (a) How do you set the address for the MCP23016? What range of addresses can the chip have? How many chips can be used on a single IIC bus?
  - (b) How many registers does the chip have?
2. Write a C function *unsigned char iic\_receive(void)* which receives all but the last two bytes of a read sequence three or more bytes long, and returns the character read from the slave device.
  3. Write a C function *unsigned char iic\_receive\_m1(void)* which receives the next to the last byte of a read sequence two or more bytes long, and returns the character read from the slave device.
  4. Write a C function *unsigned char iic\_receive\_last(void)* which receives the last byte of a read sequence two or more bytes long, and returns the character read from the slave device.
  5. Write a C function *void iic\_swrcv(void)* which switches the I2 C bus from transmit to receive, and starts the serial clock for the reception of the first byte from the slave.