Lab 5: Basic 8255 Interfacing

Task :

Study 8255, interface and run test program to light the given LED.

The 8255 is a programmable, parallel I/O device. It can be programmed to transfer data under various conditions.

The 8255 has 24 i/o pins that can be grouped primarily in two 8-bit parallel ports A and B, with remaining 8-bit as port C. The 8-bit of port c can be used as individual bits or can be grouped in two 4-bits port c_{upper} and c_{lower}

Port A: One 8 bit data output latch/buffer and one 8-bit data input latch.

Port B: One 8-bit data output latch/buffer and one 8-bit data input buffer.

Port C: One 8-bit data output latch/buffer and one 8-bit data input buffer (no latch for input). This port can be divided into two buffer (no latch for input). This port can be divided into two 4-bit ports under the mode control. Each 4-bit port contains a 4-bit latch and it can be used for the controls signal outputs and status signal inputs in conjunction with ports A and B

The function of these ports is defined by writing control word in the control register.

Control word bits								Control word	Port A	Port C upper	Port B	Port C lower
D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0					
1	0	0	1	1	0	1	1	9B	input	input	input	input
1	0	0	1	1	0	1	0	9A	input	input	input	output
1	0	0	1	1	0	0	1	99	input	input	output	input
1	0	0	1	1	0	0	0	98	input	input	output	output
1	0	0	1	0	0	1	1	93	input	output	input	input
1	0	0	1	0	0	1	0	92	input	output	input	output
1	0	0	1	0	0	0	1	91	input	output	output	input
1	0	0	1	0	0	0	0	90	input	output	output	output
1	0	0	0	1	0	1	1	8B	output	input	input	input
1	0	0	0	1	0	1	0	8A	output	input	input	output
1	0	0	0	1	0	0	1	89	output	input	output	input
1	0	0	0	1	0	0	0	88	output	input	output	output
1	0	0	0	0	0	1	1	83	output	output	input	input
1	0	0	0	0	0	1	0	82	output	output	input	output
1	0	0	0	0	0	0	1	81	output	output	output	input
1	0	0	0	0	0	0	0	80	output	output	output	output

Control word

Steps to execute program using TLLC(8255)

1. Connect XPO 86 to TLCC using FRC cable.
2. Write the program in XPO 86 and and execute it.

26 pin FRC connector:

7. 26 Pin FRC Connector(J7 and J9)

Pin No.	Description	Pin No.	Description	Pin No.	Description
1	PC_4	10	PB_5	19	PA_2
2	PC_5	11	PB_2	20	PA_3
3	PC_2	12	PB_3	21	PA_0
4	PC_3	13	PB_0	22	PA_1
5	PC_0	14	PB_1	23	PC_6
6	PC_1	15	PA_6	24	PC_7
7	PB_6	16	PA_7	25	GND
8	PB_7	17	PA_4	26	VCC
9	PB_4	18	PA_5		

Example :

Write an assembly language program in XP086 kit to send the data in port A and port C_upper to port B and portC_lower"

The address of 8255(U): 8801,8803,8805,8807 and 8255(L)):8000,8002,8004,8006

Ans:-

```
MOV  AL,98
MOV DX,8006
OUT DX,AL
MOV DX,8000
IN AL,DX
MOV DX,8002
OUT DX,AL
MOV DX,8004
IN AL,DX
AND AL,F0
MOV CL,04
SHR AL,CL
OUT DX,AL
INT A5
```

INPUT: A0=0,A1=0,A2=1,A3=1,A4=1,A5=1,A6=0,A7=0,C7=0,C6=0,C5=1,C4=1

OUTPUT: B0 B1 B2 B3 B4 B5 B6 B7 C0=0,C1=0,C2=1,C3=1

Your Assignment.

Q1`: Study the manual and understand how 8255s are interfaced. How many 8255s are interfaced in the XPO86 kit, identify the respective port addresses

(10 points)

Q2: **Q2:** Interface single LED to 8255 Port A (0) and with 0.5 second time delay or Use appropriate and display using LEDs

(15 points)

Q2: Interface the given 7-segment Display to 8255 Port A (3:0) and display digits 0 to 9 with 0.5 second time delay or Use appropriate and display using LEDs

(20 Points)

Submission in hardcopy (in Lab) and Demo.