Uva Wellassa University, Sri Lanka
End Semester Examination – September 2011
CST381-2 Device Interfacing & Embedded Systems Laboratory
Time: Three (03) hours

Index Number

Total one (01) question

1) You are required to design an "Electronic Ping-Pong game" of two players.

Each player has a push button 'paddle'. Either player can start the game by pressing the paddle. The ball represented by a LED in a row of eight LEDs, which moves from one end to the opposing player's end. Players must press the paddle only when the ball is at their "Hit zone".
If any of the players press the paddle switch, when the ball is not in their hit zone or if any of the players didn't press the paddle switch, when the ball is in their hit zone (refer the Figure 1) followings should happen.

- Ball should stop at the current position.
- One point should add to the other player's score.
- "Out play LED" should turn on until the play starts again.
- Always current score of the each player should indicate on the relevant player's Seven Segment Display (SSD).

First player to reach score of 9 will win the game.

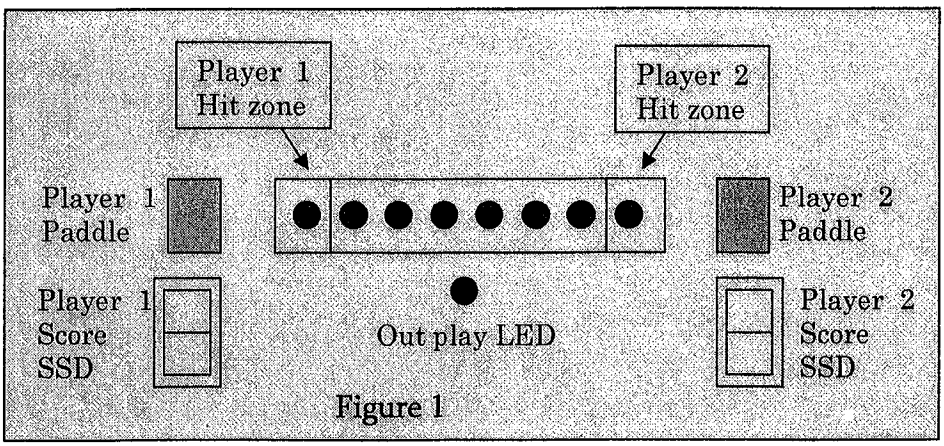

Figure 1

a. Draw a state diagram for the above scenario in your answer script.

b. Design a circuit using Proteus 7 ISIS Professional software.
You may use PIC 16F877A microcontroller and other relevant components.

c. Compile a microcontroller program to fulfill "Electronic Ping-Pong game" requirements. Comment all lines of the program.

d. Simulate the program using Proteus 7 ISIS Professional/ Real PIC Simulator.

Note:

- Answers for the part "b, c and d" should upload to the given link of the Course Management System (CMS).