Instructions for Lab – 4

Wed. 1 April and Fri. 3 April (2 - 4 pm)

[2 Marks]

The aim of this lab is to learn how to use DE0 development board.

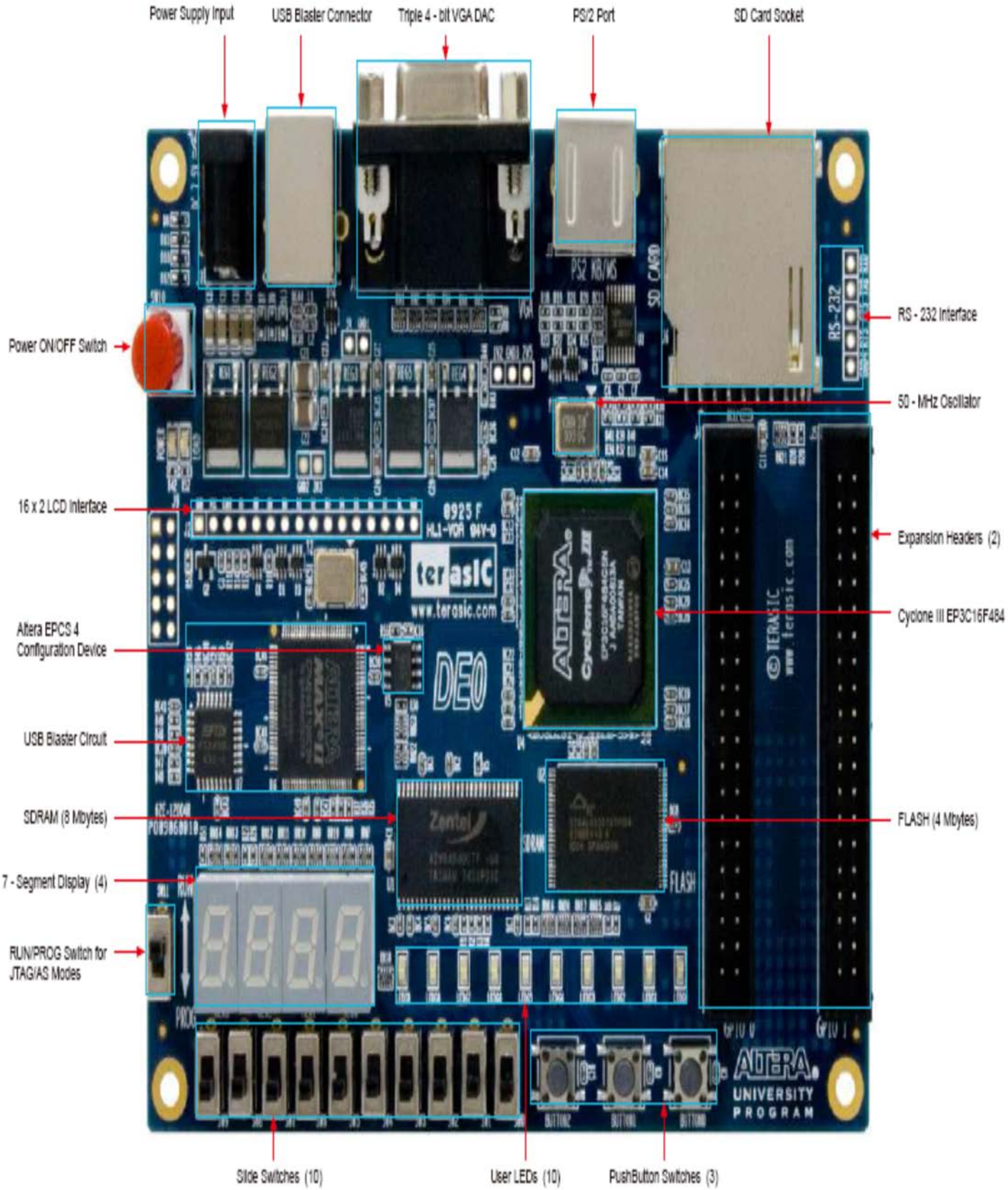
(This lab can be done by 2 students in one group).

For this lab, you should use LEDs, two 7-segment displays and two push buttons as shown in Figure on next page.
(Note that each segment on DE0 board 7-segment displays should be **'0'** in order to make that segment on).

(a) Write the VHDL code to count down from 00 to FF (as hexadecimal numbers) on 7-segment displays about **every two seconds** when button 1 is pressed. (The push button is active low).

(b) Write the VHDL code for a ***9-bit*** ring counter (or you may use the code from the lecture notes), which displays the bits on 9 Green LEDs about **every 3 seconds** when button 2 is pressed. (So, in about every 3 seconds only one Green LED is on. The push button is active low).

Refer to Chapter 4 of DE0 board manual (especially pages 22 to 26) for more details about the board and FPGA pin assignments used in this lab.


Power Supply Input
USB Blaster Connector
Triple 4 - bit VGA DAC
PS/2 Port
SD Card Socket
Power ON/OFF Switch
RS - 232 Interface
50 - MHz Oscillator
16 x 2 LCD Interface
Expansion Headers (2)
Altera EPCS 4 Configuration Device
Cyclone III EP3C16F484
USB Blaster Circuit
SDRAM (8 Mbytes)
FLASH (4 Mbytes)
7 - Segment Display (4)
RUN/PROG Switch for JTAG/AS Modes
Slide Switches (10)
User LEDs (10)
PushButton Switches (3)