Contact Hours/Week : 06   **Contact Hours/Semester : 96**

GRADED EXERCISES:

Section A:

I)   This part should be done with a simulator by using an IDE(Integrated Development Environment) such as the popular KEIL uVision.

II) The Students should be introduced to the options/menu/facilities of the IDE they are using.

III) The student should write the program using assembly language.

1. Program to add three 8 bit numbers and to store the 16 bit result in internal RAM
2. Program to add an array of 8 bit numbers and to store the 16 bit result in internal RAM
3. Program to convert two digit packed BCD to to unpacked BCD & vice versa
4. Program to convert two digit packed BCD to to ASCII & vice versa
5. Program to transfer a block of data from External to internal RAM.
6. Program to find the largest/smallest number in an array of numbers stored in external RAM.
7. Program to generate specified time delay with the use of timers.
8. Program to arrange a series of 8 bit numbers in ascending/descending order.
9. Program to illustrate an hex/bcd up/down counter(hex- 00 to FF, BCD 00 to 99)
10. Program to search for a given number in an array of numbers.
11. Program to clear all the bytes(stored in internal RAM) which have even number of 1s.
12. Program to count the number of ones and zeros in two consecutive memory locations.

Section B:

I) This part should be done with the use of standard interface modules available.

II)The student should write the program using C language..

III) A standard IDE like KEIL uVision(evaluation version can also be used with certain limitations),HEX file can be generated and has to be used to program the flash single chip based boards with interface modules for testing.

1. Interfacing of ADC by connecting a variable voltage supply to the i/p of ADC and by reading the 8 bit output of ADC and display it on 8 LEDs connected to port lines.
2. Interface DAC to generate different waveforms(like sine, square, triangular and ramp).
3.Generate different tones using DAC(PWM technique)
4. Interface stepper motor and control its speed and direction.
5. Interface traffic light controller module for a junction of four roads.
6.Interface DC motor and control its speed by PWM technique.
7.Interface push button switch & seven segment display, count the number(from 0 to 9) of times the switch is pressed and display it on Seven segment display.
8. Interface LCD module &
 (i) to output a message on the display.

(ii) to create a moving display

(iii) to display two messages alternately one on first line and another on 2nd line.

9. Interface DAC and to generate a square wave of programmable frequency(the frequency should increase/decrease with the pressing of two separate push buttons)

10. Interface DAC and to generate a square wave of programmable amplitude(the amplitude should increase/decrease with the pressing of two separate push buttons)

Scheme of Valuation

1	Record	05
2	Viva Voce	20
3	**Section A**	30
	Writing one ALP ---- 10	
	Simulation and Result -- 15	
	Print Out --- 05	
4	**Section - B**	45
	Writing One C Program - 15	
	Flash Programming & Result - 25	
	Print Out -05	
	Total	100

Department Of Technical Education
DIPLOMA COURSE
IN
ELECTRONICS   AND COMMUNICATION ENGINEERING
Fourth Semester
Subject : MICROCONTROLLERS   LAB

LIST OF EQUIPMENTS REQUIRED FOR A BATCH OF 20 STUDENTS

SL NO	NAME OF THE EQUIPMENT	SPECIFICATIONS	QUANTITY
01	Single Chip Flash Microcontroller Boards	89C61x2 Based	10 Nos.
02	Keil uVision IDE Software		20 User
03	ADC Interface Modules		03 Nos
04	Stepper Motor Interface		03Nos.
05	DC Motor Interface		03 Nos.
06	DAC Interface		03 Nos.
07	LCD Interface		03 Nos.
08	DUAL CHANNEL CRO	25 MHZ	10 NOS
09	Computers	Core2Duo,2GB Ram, 320 GB HDD	10 Nos.
10	Laser Printer		02 Nos.