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MICROCONTROLLER AND EMBEDDED SYSTEMS LABORATORY
(Effective from the academic year 2018 -2019)
SEMESTER – IV

Course Code	**18CSL48**	**CIE Marks**	40
Number of Contact Hours/Week	0:2:2	**SEE Marks**	60
Total Number of Lab Contact Hours	36	**Exam Hours**	03

Credits – 2

Course Learning Objectives: This course (18CSL48) will enable students to:

- Develop and test Program using ARM7TDMI/LPC2148
- Conduct the experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.

Descriptions (if any):

Programs List:

PART A Conduct the following experiments by writing program using ARM7TDMI/LPC2148 using an evaluation board/simulator and the required software tool.

1.	Write a program to multiply two 16 bit binary numbers.
2.	Write a program to find the sum of first 10 integer numbers.
3.	Write a program to find factorial of a number.
4.	Write a program to add an array of 16 bit numbers and store the 32 bit result in internal RAM
5.	Write a program to find the square of a number (1 to 10) using look-up table.
6.	Write a program to find the largest/smallest number in an array of 32 numbers .
7.	Write a program to arrange a series of 32 bit numbers in ascending/descending order.
8.	Write a program to count the number of ones and zeros in two consecutive memory locations.

PART –B Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.

9.	Display “Hello World” message using Internal UART.
10.	Interface and Control a DC Motor.
11.	Interface a Stepper motor and rotate it in clockwise and anti-clockwise direction.
12.	Determine Digital output for a given Analog input using Internal ADC of ARM controller.
13.	Interface a DAC and generate Triangular and Square waveforms.
14.	Interface a 4x4 keyboard and display the key code on an LCD.
15.	Demonstrate the use of an external interrupt to toggle an LED On/Off.
16.	Display the Hex digits 0 to F on a 7-segment LED interface, with an appropriate delay in between

Laboratory Outcomes: The student should be able to:

- Develop and test program using ARM7TDMI/LPC2148
- Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.

Conduct of Practical Examination:

- Experiment distribution
  - For laboratories having only one part: Students are allowed to pick one experiment from the lot with equal opportunity.
  - For laboratories having PART A and PART B: Students are allowed to pick one experiment from PART A and one experiment from PART B, with equal opportunity.
- Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.
- Marks Distribution *(Courseed to change in accoradance with university regulations)*

g) For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15 =

100 Marks

h) For laboratories having PART A and PART B
   i. Part A – Procedure + Execution + Viva = 6 + 28 + 6 = 40 Marks
   ii. Part B – Procedure + Execution + Viva = 9 + 42 + 9 = 60 Marks