

## **34064- EMBEDDED SYSTEMS PRACTICAL**

### DETAILED SYLLABUS

#### **LIST OF EXPERIMENTS**

1. STUDY OF ARM PROCESSOR KIT (whatever the ARM processor kit the institution is having) Example: LPC2148 The student should be able to Understand the memory mapping of the IO and peripherals List the peripherals present in the processor Explain that how to use an IO pin, related SFRs and instructions Explain that how to use timer, UART, its related SFR and instructions sets
2. SIMULATION OF ARITHMETIC OPERATION ON ARM IN ASSEMBLY Develop an assembly level code for the single precision (32 bit) arithmetic function. a. Addition, b. Subtraction and b. Multiplication (Note: simulate the program in the software)
3. SIMULATION OF ASSEMBLY LEVEL PROGRAM FOR SOFT DELAY Develop an assembly level code for the 32 bit or 64 bit delay routine. Calculate the no of clock taken for the routine and adjust the delay value for the desired. (Note: simulate the program in the software)
4. SIMPLE LED BLINKING WITH VARIABLE SPEED IN ASM Develop an assembly level program of ARM processor to blink a LED (including delay routine) in variable speed in the trainer kit. Upon change in the delay program the speed should vary. No need to change the speed dynamically. (Note: Student should study the list of special function registers associated for accessing the IO pin. Manual containing List of IO registers (SFR for IO) can be given to the students for the final exam)
5. REALIZATION OF INPUT AND OUTPUT PORT IN ASM Develop an assembly level program of ARM processor to read a port in which switches are connected in the trainer kit. Send back the receive input to output in which LEDs are connected in the trainer kit Note: Student should study the list of special function registers associated for accessing Port the read and write. Manual containing List of IO registers (SFR for IO) can be given to the students for the board exam)
6. SIMPLE LED BLINKING WITH VARIABLE SPEED IN C Develop a C program for ARM processor to blink a LED (including delay routine) in variable speed. Upon change in the input switch the speed should vary. (Note: The C code should be in while loop)
7. SEVEN SEGMENT LED DISPLAY INTERFACE IN C Develop a C program for ARM processor to interface a seven segment LED display. The display should count up for every one second.

8. SEVEN SEGMENT LED DISPLAY INTERFACE IN C Develop a C program for ARM processor to interface a seven segment LED display. The display should count up for every one second. The delay can be used from experiment.
9. REALIZING TIMER PERIPHERAL IN ARM BY POLLING METHOD Develop a C program for ARM processor to run a timer peripheral in ARM. The timer flag can be pooled for timer end. As timer ends reset the timer and update new value to the LED display.
10. REALIZING TIMER PERIPHERAL IN ARM BY INTERRUPT DRIVEN METHOD Develop a C program for ARM processor to run a timer peripheral in ARM. The timer flag can be pooled for timer end. As timer ends reset the timer and update new value to the LED display.
11. SERIAL TRANSMISSION AND RECEPTION OF A CHARACTER IN C BY POLLING METHOD Write a C Programs for receiving a character from other device (Computer) and send the next character of the received one to the device back. Note: Student should understand the SFRs used for serial communication. Manual containing list of SFRs for the UART can be given to the students for their final examination
12. SERIAL TRANSMISSION AND RECEPTION OF A CHARACTER IN C BY INTERRUPT METHOD Write a C Programs for receiving a character from other device (Computer) and send the next character of the received one to the device back.
13. DISPLAYING ALPHANUMERIC CHARACTERS IN 2X16 LINE LCD MODULE Write a C Programs for displaying a number and an alphabet in the LCD module by just calling the built in LCD function. The display should come in the desired line and column. (Built in function for the LCD can be given in the manual)
14. CONVERTING HEXADECIMAL TO DECIMAL AND TO DISPLAY IN LCD Write a C Programs for converting the given 8 bit hexadecimal into decimal and there by converting into ASCII which is to be displayed in the LCD module. (Built in function for the LCD can be given in the manual)
15. ACCESSING INTERNAL ADC OF THE ARM PROCESSOR AND TO DISPLAY IN LCD Write a C Program for reading an ADC, convert into decimal and to display it The ADC input is connected to any analog sensor. (Note: Student should study the SFR associated with ADC, Manual containing List of SFR for accessing ADC can be given for the examination.)