Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU

School of Engineering

Mid - Term Examinations - November 2024

Semester: VII | **Date**: 05/11/2024

Course Code: ECE3040 | **Time**: 02.00pm to 03.30pm

Course Name: Embedded System design | **Max Marks**: 50

Program: B. Tech | **Weightage**: 25%

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. 2Mx5Q=10M

1	Distinguish between 8051 and LPC2148 Architectures. (Any four points)	2 Marks	L2	CO1
2	Explain the 3-stage pipelining in ARM architecture.	2 Marks	L2	CO2
3	Explain the significance of Pin Connect Block in LPC2148.	2 Marks	L2	CO2
4	Write short note in concept of branching in ARM programing.	2 Marks	L2	CO1
5	Justify the following statement. "LPC2148 is Load-Store architecture."	2 Marks	L2	CO1

Part B

Answer ALL Questions. Each question carries 10 marks. 4QX10M=40M

6	6a	Ten numbers are stored in internal RAM of LPC2148 from memory location 10000000h. Write an assembly language program (ALP) to transfer the complement of the original number other memory block from 20000000h onwards.	5M	L3	CO
	6b	Justify the following statement. "The excessive use of program flow control instructions affects the throughput of microcontroller architecture."	5M	L2	CO
		OR			
7		An embedded system design engineer has been given a task of robotic car design using four DC motors and a switch which is acting as an obstacle detection mechanism. When there is no obstacle ahead of car it moves in forward direction and output of switch is '0' and vice-versa. Design the given embedded system with supporting circuit diagram and embedded C code.	10M	L3	CO

8	8a	Highlight the importance of following assembly language instruction for LPC2148 microcontroller. 1]NOP 2]CMP	5M	L2	CO
	8b	Ten numbers are stored in internal RAM of LPC2148 from memory location 20000000h. Write an assembly language program (ALP) to compute Two's (2's) complement of the original number store it from 20000000h onwards.	5M	L3	CO
		OR			
9		Two hundred and thirty numbers are stored in internal RAM of LPC2140 from location 000012000h. Write an ALP to sort those numbers in descending order. Also mention the stepwise procedure before program.	10M	L3	CO
10	10a	Write a brief note on the concept of little and big endian microcontroller/ microprocessor architectures.	05M	L2	CO
	10b	In real world interacting applications such as DC motor interfacing external hardware driver is connected between motor and microcontroller. Write brief note on need of hardware device drivers with suitable diagram.	05M	L2	CO
		OR			
11		An embedded system design engineer is been given with the task of designing public address system consists of a LCD display interfaced with LPC2148. Elaborate the design process with necessary circuit diagram and embedded C program to display message "LPC2148" on first line and "ARM7TDMI" on second line.	10M	L3	CO
12		Eight (8) switches and 8 LEDs are connected to LPC2148 GPIO port pins from 0.0 to 0.7 and 0.8 to 0.15 respectively. The 8 LEDs are associated 8 switches connected. Write an embedded C program to check status of each switch and turn on LED if associated switch is ON or vice-versa. (Draw the necessary circuit diagram.)	10M	L3	CO
		OR			
13		Write a brief note on design of an application using LPC2148 microcontroller. Direct your note towards real word peripheral interfacing applications and its detailed procedure with role of necessary SFRs.	10M	L2	CO