MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL (A constituent unit of MAHE, Manipal)

## I SEMESTER M. TECH (Common for ECA AND IOT) END SEMESTER EXAMINATION NOVEMBER - DECEMBER 2023 Embedded System Design: Hardware & Software (ICE 5113) Note: Answer All questions.

Ti	me:3 Hours 30-11-2023	ſ	ИАХ. МА	RKS: 50	
Q. No	Question	Μ	СО	PO	BL
1A	With relevant example and necessary diagrams illustrate the processor design steps.	è 5	1	1-6	3
1B	Differentiate between types of embedded systems, classified based or deterministic behavior.	n <b>3</b>	1	1-6	3
1C	How does thumb two architecture differ from thumb one in ARM.	2	2	1-6	4
2A	Draw the detailed block diagram of Cortex M3 architecture and illustrate the functions of bus interface system.	5	2	1-6	2
2B	Elaborate different versions of ARM processors in V7 architecture.	3	2	1-6	2
2C	Write the C code statements to check whether the push buttor connected at P1.5 is pushed and released.	2	3	1-6	4
3A	Write an ALP for LPC1768 to separate even numbers from an array of size 10 residing in the data memory and store the even numbers in different memory locations.	7 <b>5</b>	2	1-6	5
3B	A proximity sensor placed in an entrance is connected to P2.3 or LPC1768 to monitor the entry of people through the entrance. Write the C code statements to monitor the changes in the sensor output and increment a count value for every changes.	f <b>3</b>	3	1-6	4
3C	How would you configure the I/O pins of LPC1768 for multiple functions? Illustrate the process with relevant example.	e 2	3	1-6	4
4A	Develop an embedded C code for LPC1768 for the LED's interfaced a pins P0.16-P0.23 to blink one after other from left to right continuously when the switch connected at P1.5 is ON.	t 5	3	1-6	5
4B	Illustrate the I/O port configuration of LPC1768 controller.	3	3	1-6	3
4C	Discuss a suitable example to illustrate the use of FIOMASK register	. 2	3	1-6	3
5A	Draw the circuit diagram for interfacing a 16x2 LCD display module with LPC1768. Develop an embedded C code to display the text MIT on the LCD module.	9 5 -	4	1-6	5
5B	With suitable example differentiate between makeable and non makeable interrupts.	- 3	5	1-6	4
5C	Demonstrate the steps to enable an interrupt in LPC1768.	2	5	1-6	3