Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– I (New course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 2710311 **Date:13/05/2015**

Subject Name: Embedded System for Instrumentation

Time: 10:30 am to 1:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain operational modes and states of Cortex M3/M4 processors with neat sketch.	**07**
	(b)	Explain xPSR registers in brief.	**07**
Q.2	**(a)**	Draw and explain basic memory map of Cortex M3/M4 processor. Also give address ranges.	**07**
	(b)	What are exceptions and interrupts? Explain working of NVIC in brief.	**07**
		OR	
	(b)	Write an ALP to increment the register value by 1 after every one second.(Assume initial value stored in register is 0)	**07**
Q.3	**(a)**	Explain the working of following instructions. 1) LDRSB Rd, [Rn, #offset] 2)RBIT Rd, Rn 3) STRD Rd1, Rd2, [Rn, #offset]! 4)LDMIA Rn!, <reg list> 5) SXTH Rd, Rm;	**07**
	(b)	Explain various types of shift and rotate instructions with a neat sketch.	**07**
		OR	
Q.3	**(a)**	Write an ALP to add the contents of two 64 bit variables Value 1 and Value2.	**07**
	(b)	Enlist the various types of data types available in in ARM Architecture Including Cortex-M Processors with their size and range.	**07**
Q.4	**(a)**	Write a program to sort an array of ten 32 bit numbers in descending order.	**07**
	(b)	Discuss the features of cortex M processors in brief.	**07**
		OR	
Q.4	**(a)**	Write an ALP to scan a series of sixteen 16 bit numbers to find the largest number.	**07**
	(b)	What is lazy stacking? Enlist the different scenario for the same and explain any two along with the key element.	**07**
Q.5	**(a)**	Write an assembly language program to divide a 32 bit binary number by 16 bit binary number, store the quotient and reminder on consecutive memory location.	**07**
	(b)	Explain in brief what happens when the microprocessor resets.	**07**
		OR	
Q.5	**(a)**	Explain how interrupts are handled by cortex M processors.	**07**
	(b)	Write an assembly language program to find the factorial of number X. (Assume the value of X is between 0 & 7)	**07**

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