Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–II EXAMINATION – SUMMER 2015

Subject Code: 2725404 **Date: 26/05/2015**

Subject Name: Mixed Signal Controllers

Time: 02:30 PM to 05:00 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)** Answer the following **07**

1. Explain the characteristics of low power mode LPM0.
2. Explain Why Comparator is considered as 1 bit ADC.
3. Hardware multiplier does not interfere with CPU activitiesï Justify this statement.
4. Why MSP430 is said to have orthogonal architecture?
5. When PUC reset is generated?
6. Little-endian ordering may appear more logical but has one awkward outcomeï Justify this statement.
7. What is difference between real and emulated instructions?

(b) 1. Explain the role of Buffer in ADC. **04**

2. Explain following instructions with examples: BIC ,BR,DINT. **03**

Q.2 **(a)** What is the need of watchdog timer in MSP430? Differentiate between the function of watchdog timer in watchdog mode and interval mode. **07**

(b) Specify the conditions for all low power modes and Explain the function of DCO in MSP430. **07**

OR

(b) Explain timer modes in detail. **07**

Q.3 **(a)** Explain the block diagram of Analog to Digital Convertor in MSP430 CPU. **07**

(b) Write a C language program for ADC. Take A1 as an input, 1.5 as a reference voltage. Set P1.0 if A1 > 0.2V. Use LPM0 mode to save power until ADC10 conversion complete. **07**

OR

Q.3 **(a)** Explain the conversion modes of ADC. **07**

(b) Explain the use of Analog to Digital Convertor in digitizing multiple analog channels and Write a program for Multiple Channel in Sequence. **07**

Q.4 **(a)** Explain the block diagram of DAC12 in MSP430. **07**

(b) Explain all the registers of Hardware multiplier. Write a C program to multiply two 16 bit signed numbers. **07**

OR

Q.4	**(a)**	Write a C language Program to configure a Digital to Analog Convertor module to generate a positive ramp using DAC12 and 2.5V as a reference.	**07**
	(b)	Explain the function of comparator in MSP430. Illustrate one of its application.	**07**
Q.5	**(a)**	List all the transfer modes in DMA and explain any two in detail.	**07**
	(b)	Describe the addressing modes in MSP430 CPU.	**07**

OR

Q.5	**(a)**	Design FIR filter using MSP430 (Using multiplier, timer and DMA).	**07**
	(b)	Write a C language program to toggle LED every second using timer A. Use ACLK and Up mode.	**07**

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