Visvesvaraya Technological University, Belagavi
MODEL QUESTION PAPER
5th Semester, B.E (CBCS) EC
Course: 15EC555 - MSP430 Microcontroller

Note: (i) Answer Five full questions selecting any one full question from each Module.
     (ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Time: 3 Hrs   **Max. Marks: 80**

		Module-1	
1	a.	Sketch the functional block diagram of MSP430 microcontroller and briefly explain its architecture.	10
	b.	Show the Memory map of F2013 MSP430 and explain it briefly.	06
		OR	
2	a.	Differentiate between a Microprocessor and a Microcontroller. Which are the different peripherals that would be available in a Microcontroller?	04
	b.	Briefly explain about the 16 Registers of MSP430 CPU.	06
	c.	Explain briefly the different Resets provisions in MSP430 and the conditions after Reset.	06
		Module-2	
3	a.	With an example explain the different Addressing Modes of data available for MSP430.	10
	b.	Write an ALP to move six bytes of data present in a memory block to another memory block.	06
		OR	
4	a.	Indicate the different Arithmetic instructions available for MSP430 and explain their operation briefly.	10
	b.	Write an ALP to check whether the content of the Register R4 of MSP430 is Even/Odd. If it is Even, set the value of the Register R5 to 00EEH, otherwise reset it to 0000H.	06
		Module-3	
5	a.	Explain the Clock system of MSP430 with the help of its simplified block diagram.	10
	b.	Which are the Low Power operating modes of MSP430? Explain them briefly.	06

		OR	
6	a.	Write a MSP430 C program to toggle two LEDs connected to P2.3 and P2.4 bits of Olimex 1121STK kit, using the interrupt generated by channel 0 of Timer_A in up mode.	08
	b.	Explain the operation and uses of Watchdog timer in MSP430.	06
	c.	Differentiate between the Capture and Compare mode of operations of Timer_A of MSP430.	02
		Module-4	
7	a.	Explain the architecture and operation of Comparator_A+ of MSP430 with the help of a block diagram.	08
	b.	Give a circuit diagram using MSP430F2002 to measure an analog voltage and explain the scheme of measurement.	08
		OR	
8	a.	Explain the operation of Sigma-Delta ADC of MSP430 with its block diagram.	08
	b.	With an example explain how a PWM wave can be generated using MSP430 CPU.	08
		Module-5	
9	a.	Which are the Eight registers that are associated with the configuration of Port1 of MSP430? Explain their functions briefly.	08
	b.	Interface a simple LED to MSP430 and write a C program to flash the LED using an appropriate software delay.	05
	c.	Give the format of Asynchronous serial data communication.	03
		OR	
10	a.	Explain briefly about the Communication peripherals that are available in MSP430.	06
	b.	Interface a Push button switch and a simple LED to MSP430 and write a C program to switch on the LED whenever the button is pressed.	08
	c.	Write a note on RS232 standard.	02

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