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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Second Semester, M. Tech – VLSI Design and Embedded System (MECE)

Make-up Examination; July - 2016

Advanced Microcontrollers

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*
ii) Assume missing data suitably.

UNIT - I

1	a.	Substantiate necessity of two clock sources in MSP 430 and enumerate on different clocks produced by them.	8
	b.	List the essential components of a microcontroller and with neat sketch show their interconnections. State their importance and relevance.	7
	c.	Explain the role and importance of Bootstrap loader Information memory and code memory.	5
2	a.	Differentiate between Hardvard and Von-Neuman architecture. Draw a neat block schematic of both.	6
	b.	Draw the neat block schematic of MSP 430F 2003. Explain function of blocks used for peripheral function.	8
	c.	List the type of non volatile memory used in digital design stating their highlighting features.	6

UNIT - II

3	a.	Explain functionality of each bit in status register in MSP 430.	6
	b.	Explain the necessity of different addressing modes. List the different addressing modes of MSP 430 and explain them with an example.	10
	c.	Differentiate between Logical and Arithmetic shift with an example.	4
4	a.	Write an explanatory note of 'RESET' mechanism in MSP 430 clearly bringing out type of resets and conditions after Reset.	10
	b.	Show the Breakdown of format I instruction used with double operand.	4
	c.	Explain significance of constant generator and emulated instruction in MSP 430.	6

UNIT - III

5	a.	Draw the neat diagram of ADC 10 and explain importance and functionality of each unit.	8
	b.	Explain how watchdog can be used as an Interval timer.	4
	c.	Briefly describe different issues associated with interrupts in MSP 430.	8
6	a.	List the different Low-Power modes of MSP 430 and explain significance of each mode.	6
	b.	Discuss the different possible configuration of port pins (take port 1) highlighting their significance.	10
	c.	Compare sigma delta and successive approximation ADC.	4

Contd… 2

UNIT - IV

7	a.	Draw the simplified view of Cortex-M3 and Briefly explain functionality of each unit.	10
	b.	Explain core sight architecture based debugging support in Cortex-M3.	6
	c.	What are the special registers present in Cortex-M3 and mention their significance.	4
8	a.	List the important features offered by Nested vectored interrupt control and explain them.	6
	b.	Explain necessity of switching between ARM to thumb code and also explain the switching operation.	8
	c.	List and explain major benefits and advantages of Cortex-M3.	6

UNIT - V

9	a.	Explain concept of PWM and its role in power supplies with neat sketch.	10
	b.	Explain the role played by MPU in improving reliability of an embedded system and explain the process of setting up of MPU with neat flow chart.	10
10	a.	Explain the significance of Wireless Sensor Networks and role played by MSP 430 in managing this network.	10
	b.	List the different categories of fault exceptions and briefly describe them.	10

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