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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)
Semester End Examination; June - 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.	Compare Harvard and Von-Neuman architecture with an example for each.	7
b.	Write the important features of MSP 430 that makes it suitable for low power and portable applications.	7
c.	With a neat diagram, explain the architecture of MSP 430/F2003 microcontroller.	6
2 a.	Explain the registers in the CPU and memory map of MSP 430/F2003 microcontroller.	10
b.	What is an addressing mode? Explain the different addressing modes in MPS 430 µC with an example for each addressing modes.	10

UNIT - II

3 a.	Explain the POR and PUC. What are the differences between POR and PUC? What happen when reset button is pressed in MSP 430/F2003 microcontroller?	10
b.	With a neat diagram, explain the clock system of MSP 430/F2003 microcontroller.	10
4 a.	Explain the features and functions of the watch dog timer in MSP 430/ F2003 microcontroller.	10
b.	Describe the various low power modes of operation in MSP 430 microcontroller.	10

UNIT - III

5 a.	Explain the internal structure of MSP 430F2003 Timer A module.	10
b.	With a block diagram, explain the architecture and features of the ADC to module.	10
6 a.	Explain the internal structure of comparator module in MSP 430 microcontroller above with its operation.	10
b.	Write short note on PWM in power supplies with MPS 430 microcontroller.	10

UNIT - IV

7 a.	With a neat diagram, explain the overview of the ARM Cortex-M3 processor.	10
b.	Explain the different operating modes of ARM CORTEM3 processor.	5
c.	Explain the memory map of ARM Cortex-M3 processor.	5
8 a.	What is a stack? Explain how stack operates in ARM Cortex-M_3 with an example.	10
b.	What are exceptions? Explain different exception handled by ARM-Cortex M3 processor.	10

UNIT - V

9 a. Discuss the important features of the NVIC of Cortex-M3 and configurations registers. 10

   b. What are the merits of using MPU? With a flow chart, explain the step used to set up the MPU. 10

10 a. Explain nested interrupts, tail chaining interrupts and the late arrival exception in ARM Cortex- M3 processor. 10

   b. What is debugging? Explain the debugging architecture in ARM Cortex-M3 processor. 10

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