***U.S.N*** | | | | | | | | | | |

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

***(An Autonomous Institution affiliated to VTU, Belagavi)***

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

**Semester End Examination; June - 2017**

**Advanced Micro Controllers**

*Time: 3 hrs* *Max. Marks: 100*

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

**UNIT - I**

| | | | |
|---|---|---|---|
| 1 | a. | List the important features of MSP430MC and specify its advantages over other micro controllers. | 6 |
| | b. | Compare the volatile and non volatile memory with an example for each. | 7 |
| | c. | Explain the essential components of a micro controller with a neat sketch. | 7 |
| 2 | a. | Differentiate between Harward and Von-Neuman architecture. Draw a neat diagram for both. | 5 |
| | b. | Differentiate between micro processor and micro controllers by giving an example for each. | 5 |
| | c. | With a functional block diagram, explain the functions of each block on MSP 430MC. | 10 |

**UNIT - II**

| | | | |
|---|---|---|---|
| 3 | a. | What is a stack? Explain the stack operation in MSP430 with an example. | 7 |
| | b. | What is addressing mode? Explain the different addressing modes with an example for each. | 8 |
| | c. | Explain the memory map of the MSP 430 F 2013 MC with a neat sketch. | 5 |
| 4 | a. | List the resistors in the CPU of the MSP 430MC and explain them. | 5 |
| | b. | Explain the importance of constant generator and emulated instructions with an example. | 7 |
| | c. | Differentiate between POR and PUC. What happens when "RESET" key is pressed in MSP 430MC? | 8 |

**UNIT - III**

| | | | |
|---|---|---|---|
| 5 | a. | Explain the working of ADC IO with a neat sketch. | 8 |
| | b. | Using simplified block diagram, explain the clock module of MSP 430 microcontrollers. | 7 |
| | c. | What is an intempt? What happens when an intempt is requested in MSP 430MC? | 5 |
| 6 | a. | What is a subroutine? What are the ways in which you can pass parameters to subroutines? Explain with program codes. | 8 |
| | b. | Discuss the low power modes of operation of MSP 430 Micro controllers. | 7 |
| | c. | Explain the operation of WDT in MSP 430 micro controllers. | 5 |

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**UNIT - IV**

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|---|---|---|---|
| 7 | a. | Draw the simplified view of the cortex-m3 and explain the functionality of each unit. | 10 |
| | b. | With a neat diagram, explain the special resisters available in Cortex-M3 and mention their significance. | 10 |
| 8 | a. | Describe the important features of NVIC. | 6 |
| | b. | Explain the different operation modes and privilege levels in Coxtex M3. | 7 |
| | c. | What is an exception? Explain different types of exception in Cortex-M3MC? | 7 |

**UNIT - V**

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|---|---|---|---|
| 9 | a. | Explain the working of PWM with neat sketch. | 8 |
| | b. | Explain the role of MPV in an embedded system. Explain the process of setting up of MPV with neat flow chart. | 7 |
| | c. | List the debugging features in Cortex-M3? | 5 |
| 10 | a. | Discuss briefly debug system in the Cortex-M3 with a neat diagram. | 8 |
| | b. | Explain the role played by MSP 430 in managing wireless sensor network and explain its significance. | 7 |
| | c. | Explain the importance of low power RF circuit in MSP 430ML. | 5 |

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