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

(An Autonomous Institution affiliated to VTU, Belagavi)

**Fourth Semester, B.E. - Electronics and Communication Engineering**

**Semester End Examination; May / June - 2018**

**Microcontroller**

*Time: 3 hrs*

*Max. Marks: 100*

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

### UNIT - I

- |   |  |    |
|---|--|----|
| 1 | a. How memory is classified? Briefly explain different types of memories.              | 10 |
|   | b. Write a functional block diagram of MSP430 microcontroller showing the inside view. | 10 |
| 2 | a. Show the memory map of MSP430 microcontroller.                                      | 10 |
|   | b. Explain clock generator and the exceptions of MSP430 microcontroller.               | 10 |

### UNIT - II

- |   |  |    |
|---|--|----|
| 3 | a. Explain in brief the function of each of the registers in MSP430 microcontroller. | 10 |
|   | b. What are the different addressing modes? Explain each with an example.            | 10 |
| 4 | a. Explain the operation of stack in MSP430.   | 10 |
|   | b. Give examples of each of the arithmetic and logic instruction in MSP430.          | 10 |

### UNIT - III

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|-----|--|----|
| 5a. | What happens when an interrupt is requested? Give sequence of events.        | 10 |
|     | b. What are the low power modes associated with MSP430? Explain briefly.     | 10 |
| 6a. | What are the issues associated with interrupts?                              | 10 |
|     | b. Differentiate among function, subroutines and interrupt service routines. | 10 |

### UNIT - IV

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|-----|--|----|
| 7a. | What are the different timers associated with MSP430? Explain the function of watch dog timer. | 10 |
|     | b. With a block diagram, explain basic Timer 1.  | 10 |
| 8a. | Differentiate between edge aligned and centered pulse width modulation.                        | 10 |
|     | b. Write state transition table and diagram for a 2-bit up counter with enable input.          | 10 |

### UNIT - V

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|------|---|----|
| 9a.  | Explain the operation of comparator A+ with relevant diagram.               | 10 |
|      | b. What are the general issues encountered in analog to digital conversion? | 10 |
| 10a. | Explain ADC-10 with relevant block diagram.                                 | 10 |
|      | b. Explain how a temperature sensor be interfaced to ADC-10?                | 10 |

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