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

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; Dec. - 2019

Microcontroller and Application

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

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| 1 a. | Explain typical small microcontroller with the help of neat diagram of essential component of a microcontroller. | 8 |
| | b. Explain the various volatile and non-volatile memories available in microcomputer system. | 8 |
| | c. Differentiate between Harvard and Von-Neumann architecture. | 4 |
| 2 a. | Explain the peripheral functions of F2013 with neat block diagram. | 8 |
| | b. Discuss about the CPU of the MSP430. | 7 |
| | c. Define Exception. Discuss the classes of exception applicable to MSP430. | 5 |

UNIT - II

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| 3 a. | List and explain different addressing modes used in MSP430 with examples. | 8 |
| | b. List the instruction set used in MSP430 and explain arithmetic and logic instruction with examples. | 7 |
| | c. Enumerate the speciality of constant generator and its usefulness. | 5 |
| 4 a. | What is Resets? Explain POR and PUC conditions. | 5 |
| | b. Discuss starting up in special modes. | 5 |
| | c. Explain briefly about clock system using simplified block diagram of clock module. | 10 |

UNIT - III

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| 5 a. | Discuss the basic operation of subroutine when it is called. | 5 |
| | b. Explain the methods to pass parameters to and from the subroutines. | 9 |
| | c. Explain the operations performed when an interrupt is requested. | 6 |
| 6 a. | Explain interrupt service routines in assembly language and in C language using interrupt generated by timer-A in upmode. | 10 |
| | b. Explain issues associated with interrupt service routine. | 5 |
| | c. Discuss non-maskable interrupt. | 5 |

UNIT - IV

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| 7 a. | Explain capture/compare control register TACCTLn of Timer-A in MSP430. | 10 |
| | b. Describe the edge aligned PWM in the upmode configuration of timer-A and sketch the output with interrupt. | 10 |

- 8 a. With a neat block diagram, explain the architecture of comparator-A⁺. 10
- b. Discuss the architecture ADC10 successive approximation ADC with a neat block diagram. 10

UNIT - V

- 9 a. Discuss light LED's in C language and assembly language programming with example programmes. 10
- b. Discuss liquid crystal display and its applications. 10
- 10 a. List and explain the communication peripherals used in MSP430. 10
- b. Discuss the concept of serial peripheral interrupt interface between master and single slave with the help of diagram. 10

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