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

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

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

## Fifth Semester, B.E. - Electrical and Electronics Engineering

## Semester End Examination; Dec - 2017/Jan - 2018

## Microcontrollers

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

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

### UNIT - I

| | | |
|---|---|---|
| 1 a. | Draw and explain the internal architecture of 8051. | 12 |
| b. | Compare RISC and CISC processor. | 8 |
| 2 a. | What are the differences between microprocessor and microcontroller? | 6 |
| b. | Explain the significance of PSW. | 6 |
| c. | Explain the RAM memory space allocation in the 8051. | 8 |

### UNIT - II

| | | |
|---|---|---|
| 3 a. | Explain different addressing modes of 8051. | 12 |
| b. | Explain different rotate operation with an example. | 8 |
| 4 a. | Explain byte level and bit level logical operation. | 6 |
| b. | Explain PUSH and POP operation. | 4 |
| c. | Explain external program memory access with timing waveform. | 10 |

### UNIT - III

| | | |
|---|---|---|
| 5 a. | Explain the following instructions with an example :<br>(i) DAA (ii) SUBB (iii) ADDC. | 6 |
| b. | Explain the following instructions with their relative range :<br>(i) LJMP (ii) SJMP (iii) AJMP. | 6 |
| c. | Write a program to find the sum of *N* numbers. | 8 |
| 6 a. | Explain the following with an example :<br>(i) LCALL (ii) ACALL | 4 |
| b. | Write a program to find the maximum number in a given list of *N* numbers. | 8 |
| c. | Write a program to sort the given *N* number in ascending order. | 8 |

### UNIT - IV

| | | |
|---|---|---|
| 7 a. | Explain the significance of TMOD register. | 8 |
| b. | Write a program to generate a square wave with an ON time of 3 ms and an OFF time of 10 ms on all pins of port 0. Assume XTAL of 22 MHZ. | 8 |
| c. | Explain the basic registers of the timer. | 4 |
| 8 a. | Explain the mode-1 programming operations. | 10 |
| b. | Explain the mode-2 programming operations. | 10 |

Contd…2

**UNIT - V**

| | | | |
|---|---|---|---|
| 9 | a. | What is interrupt service routine? What are the different steps of an interrrupt execution? | 8 |
| | b. | Mention the different interrupt in the 8051 with interrrupt vector table. | 6 |
| | c. | Explain half duplex and full duplex data transfer. | 6 |
| 10 | a. | What is a serial communication? How is this achieved with 8051 using RS232 standard? | 8 |
| | b. | Explain the significance of SCON register. | 6 |
| | c. | Explain Enabling and Disabling an interrupt in 8051. | 6 |

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