# UNIVERSITY OF PUNE

**[4363]-184**

**T. E. (*E & TC*) Examination - 2013**

*Microcontroller And Application (2008 Course)*

**[Total No. of Questions:** *12*] **[Total No. of Printed Pages: 3]**

**[Time:** *3* **Hours]** **[Max. Marks: 100]**

***Instructions:***

1 *Answer any three questions from each section.*

2 *Answers to the* ***two sections*** *should be written in* ***separate answer-books.***

3 *Neat diagrams must be drawn wherever necessary.*

4 *Black figures to the right indicate full marks.*

5 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

6 *Assume suitable data, if necessary.*

## SECTION –I

| | | | |
|---|---|---|---|
| Q.1 | A | Differentiate between microprocessor and microcontroller with general architecture and features. | 8 |
| | B | State family member and resources of 8051 series microcontroller. | 8 |

**OR**

| | | | |
|---|---|---|---|
| Q.2 | A | Explain Harvard & van-Neumann architecture. | 8 |
| | B | Explain criteria for choosing a microcontroller. | 4 |
| | C | Explain how performance of any microcontroller is evaluated. | 4 |
| Q. 3 | A | Explain different timer/counter modes of 8051. | 8 |
| | B | Explain interrupt structure in 8051 microcontroller. | 8 |

**OR**

| | | | |
|---|---|---|---|
| Q. 4 | A | Explain PSW register of 8051 also explain the stack operation and stack pointer register of 8051 what is its | 8 |

reset value.

| | | | |
|---|---|---|---|
| | B | Write ALP for 8051 microcontroller to obtain parity (odd/even) of a given number. | 5 |
| | C | State salient features of 8051 microcontroller. | 3 |
| Q. 5 | A | State and explain with the help of examples addressing modes of 8051. | 10 |
| | B | Write a program the transfer a string "Mother India" located at memory location 200H to memory location 300H. | 8 |

**OR**

| | | | |
|---|---|---|---|
| Q. 6 | A | Explain following instructions.<br>i) JNZ ii) PUSH iii) ACALL iv) RLC A v) CJNE | 10 |
| | B | Explain<br>i) Logic analyzer<br>ii) Cross Assembler<br>iii) Emulator<br>iv) Embedded C | 8 |

**SECTION II**

| | | | |
|---|---|---|---|
| Q. 7 | A | Interface 8-bir ADC to 8051 microcontroller and write to generate following waveform continuously. | 8 |

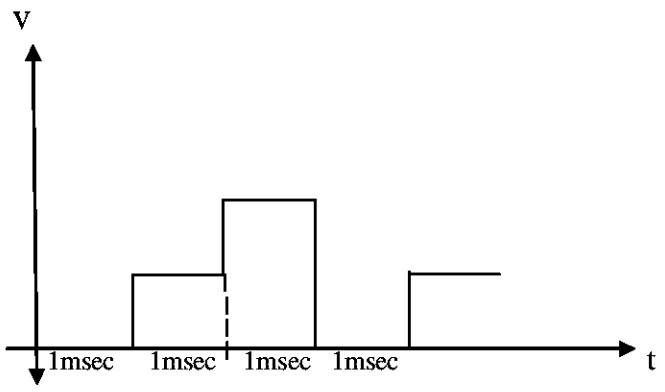


Fig.

| | | | |
|---|---|---|---|
| | B | Differentiate between Rs232 & Rs485. | 4 |
| | C | Write ALP for 8051 microcontroller to blink LED's connected on part P1 after way one second using timer O interrupt.<br>(Assume: XTAL-11.0592MHz) | 4 |

**OR**

| | | | |
|---|---|---|---|
| Q. 8 | A | Draw interfacing diagram to interface 16×2 LCD with 8051 in 4-bit mode and write ALP to display "UNIPUNE" on first line and "BCUD" on second line. | 8 |
| | B | Write short notes on<br>i) SPI<br>ii) I2C | 8 |
| Q. 9 | A | Draw and explain status register of PIC microcontroller. | 8 |
| | B | Write embedded C program to blink LED connected to part B of PIC. | 8 |

**OR**

| | | | |
|---|---|---|---|
| Q. 10 | A | Describe in details memory organization of 18Fxxxx | 8 |
| | B | Explain watchdog time. Also describe rescaling. | 8 |
| Q. 11 | | Design a system to interface LM35 to 89C51 /PIC. Draw complete system diagram. Draw flowchart and write program the neat and display temperature on second line of 16×2 LCD display. First line of 16×2 should display "Temp". | 18 |

**OR**

| | | | |
|---|---|---|---|
| Q. 12 | | Design a test board board on 8051 microcontroller for data acquisition purpose. The board should have 4×4 keypad interface, I2C bared ADC/DAC interface, Rs232 and Rs485 interface, DS1307 interface and 16×2 LCD interface. Draw complete interfacing diagram and describe each interface. | 18 |