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Seat No.	
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T.E. (E & TC) EXAMINATION, 2014
MICROCONTROLLER AND APPLICATION
(2008 PATTERN)

Time : Three Hours**Maximum Marks : 100**

- N.B. :—** (i) Answers to the two sections should be written in separate answer-books.
- (ii) Answer any *three* questions from each Section.
- (iii) Neat diagrams must be drawn wherever necessary.
- (iv) Figures to the right indicate full marks.
- (v) Use of calculator is allowed.
- (vi) Assume suitable data, if necessary.

SECTION I

1. (a) Explain criteria for choosing a microcontroller. [8]
- (b) Discuss briefly features of Microcontroller and resources in advanced microcontroller. [8]

Or

2. (a) (i) Compare the power down and idle mode of 8051 microcontroller. [4]
- (ii) Differentiate between microprocessor and microcontroller. [4]
- (b) Draw and explain architecture of microcontroller. [8]

P.T.O.

3. (a) Explain the use of the following registers : [8]
(i) DPTR
(ii) Register B
(iii) PC
(iv) Accumulator.
- (b) Explain PSW register of 8051. Write code for selecting bank 2 of 8051. [8]

Or

4. (a) Explain steps to transfer data serially in 8051 and receive data serially. Give the importance of related flags. [8]
(b) Write a program to transmit letters 'CITYBUS' to serial COM port using 8051 at 9600 baud rate. Assume XTAL = 11.0592 MHz. [8]
5. (a) Write a program to copy an array of 10 elements from a location 40 H onwards to external location D050H onwards. Draw the flowchart for the same. [9]
(b) Explain different addressing modes for ORL instruction. [9]

Or

6. (a) (i) Write a program to output 55H and AAH alternately, on port 0 and 1. [4]
(ii) Write a program to complement the contents of accumulator if P1.5 = 1. [4]

- (b) Write an assembly language program to add and subtract two 16 bit hexadecimal numbers stored at the following internal RAM :

40 H—byte 1 of Number 1; 50 H—byte 1 of Number 2

41 H—byte 2 of Number 1; 51 H—byte 2 of Number 2

Store result of addition at 60 H onwards and result of subtraction at 70 H onwards. [10]

SECTION II

7. (a) Draw a neat diagram to interface 8 bit DAC to 8051 and write an assembly language program to generate a triangular wave on CRO. [8]
- (b) Move stepper motor 10 steps in clockwise and 10 steps in Anticlockwise direction and then stop the motor. Draw interfacing diagram. [8]

Or

8. (a) Write an assembly language program to generate square wave using DAC. Draw the necessary diagram. [8]
- (b) Write program for displaying 'GOOD MORNING' on 2nd line of 16X2 LCD. [8]
9. (a) Explain capture mode and compare mode of PIC microcontroller. [8]
- (b) Write embedded C program for PIC to toggle bits of port B, Port C and port D continuously with delay. [8]

Or

- 10.** (a) Explain architecture of PIC 18FXX with a suitable block diagram. [8]
- (b) Draw and explain status register of PIC controller. [8]
- 11.** (a) Design a microcontroller based DAS to measure speed of synchronous motor and display variation on LCD, make provision of interfacing analog and digital signals such as [load cell, pressure, switches] etc. [9]
- (b) Draw and explain generalized Data Acquisition System. [9]

Or

- 12.** Design a pressure measurement system using 89c51/PIC to display pressure on 16X2 LCD. Draw complete block diagram, interfacing diagram and write program for the system. [18]