E | VI | Rev. | EXTC | Nov'05 | Microcontrollers & Com

[REVISED COURSE] I.A. I.T. EXAM.

CON/4404-05. PR-4859

(3 Hours) [Total Marks : 100

N.B. (1) Question No 1 is **compulsory** and attempts any **four** out of remaining six questions.
(2) Assume **suitable data** wherever required.
(3) Figures to the **right** indicate **full marks.**

1. Design 8051 based 8 channel temperature monitoring system with following specifications 20
   - 8751 Microcontroller operating on 6 MHz (8751 is EPROM version of 8051)
   - 4KB EPROM
   - 128 Bytes SRAM
   - Four digit seven segment display
   - ADC 0809 (8 channel, 8 bit Successive Approximation type of ADC)
   - Reset facility should be provided.

   Show how the above system can be used for the monitoring the temperature in the range of 0-150 degree Celsius on four digit seven segment display Use one digit for displaying channel number and three digit for temperature.

2. (a) Write a program to send string of twenty characters on TxD line of 8051 microcontroller. A string is stored from internal data memory location 30H onward. Microcontroller operating on 11.0592MHz Choose baud rate at 9600. 10
   (b) Explain the addressing modes of 8051.Also compare MOV, MOVX, and MOVC instructions. 10

3. (a) Explain the interrupt structures of 8051 microcontroller. Explain how single stepping can be achieved. 10
   (b) Explain Internal and external memory organization of 8051 microcontroller. 10

4. (a) Explain addressing modes of 80C196 . 10
   (b) Describe functioning of HSO unit and HSI unit in 80196. 10

5. With reference to real time embedded software explain following. 20
   (a) Interrupt Latency
   (b) Context switching
   (c) Event response time
   (d) Preemptive kernel
   (e) Task and task states.

6. (a) List some services provided by RTOS Explain any three of them in detail. 10
   (b) What are the different methods of protecting shared data problem? 5
   (c) Compare methods of inter task communication in RTOS. 5

7. (a) A robot has three motors having three angle encoders. Each motor receives an input from three tasks. The fourth task measures the position of each motor and sends three directions to each motor rotate by a, b, and c degrees. The a, b and c messages are send by the fifth task. List the task, which the RTOS will schedule and show how to use RTOS functions in the system design. 10
   (b) Explain different methods of scheduling policies used in an embedded system. 10