Code No. N0423 **R07** **Set No.1**

IV B.Tech. I Semester Supplementary Examinations, February/March, 2012
MICRO CONTROLLERS AND APPLICATIONS
(Common to Electronics & Communication Engineering and Bio-Medical Engineering)

Time: 3 hours **Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) Draw and explain the basic architecture of a microcontroller. Also compare microcontrollers with microprocessors.
   b) Draw and explain TCON, TMOD registers of 8051 microcontroller. [8+8]

2. a) List and explain arithmetic and logical instructions of 8051 microcontroller.
   b) Explain the functions of the following instructions of 8051.
    i. MOV SP, #74 ii. JC 02 iii. INC @R3 iv. CPL 91H [8+8]

3. What is an interrupt? What are the sources of interrupts? Explain the interrupt structure in Intel 8051. [16]

4. Timer 0 can be used as two 8-bit timer counters. Explain its operation and control. Explain how you can program it such that one 8-bit timer as a timer and the other as an event counter. [16]

5. Explain the block diagram of keyboard-cum-display controller (8279). Also explain its interfacing with 8051. [16]

6. a) What are the main features of Keil RTX51?
   b) What are the advantages of using RTOS timer function? Explain with an example. [8+8]

7. a) Draw and explain the basic architecture of 80196 microcontroller.
   b) List and explain the CPU registers of 80196 microcontroller. [8+8]

8. a) Explain the programming model of ARM processor
   b) List and explain different data movement instructions of ARM. [8+8]

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Code No. N0423   **R07**   **Set No.2**

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Time: 3 hours   **Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
*****

1. a) Explain the resources in advanced and next generation microcontrollers.
   b) Explain the register bank of 8051 microcontroller.   [8+8]

2. a) List and explain different logical and rotate instructions of 8051 microcontroller.
   b) What is the difference between a long jump (LJMP), a short jump (SJMP) and absolute jump (AJMP) instructions of 8051.   [8+8]

3. a) Explain interrupt latency and interrupt deadline.
   b) What is non-maskable interrupt? Explain the sources of non-maskable interrupts.   [8+8]

4. What is auto reload time? How do you program Timer 1 as an auto reload timer? State an application of auto reload timer. Also write a program to generate a frequency of 1 kHz using Timer 1.   [16]

5. List the industrial applications of 8051 micro controller. Also explain the micro controller unit based measurement systems.   [8+8]

6. Explain briefly about semaphore, mailbox and message queue.   [16]

7. a) Draw and explain the PSW register of 80196 microcontroller.
   b) List and explain different interrupts available in 80196 microcontroller.
       [8+8]

8. What are the main features of ARM processors? Draw and explain the architecture of ARM processor.   [16]

Code No. N0423   **R07**   Set No.3

IV B.Tech. I Semester Supplementary Examinations, February/March, 2012
MICRO CONTROLLERS AND APPLICATIONS
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Time: 3 hours   Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
*****

1. a) What is a microcontroller? Differentiate microcontrollers and microprocessors.
   b) Explain the internal and external memories of 8051 microcontroller.   [8+8]

2. a) List and explain different data and bit manipulation instructions of 8051 microcontroller.
   b) List and explain different program flow control instructions of 8051 microcontroller.   [8+8]

3. a) What is an interrupt? Explain interrupt handling structure of microcontroller units.
   b) What is polling? How it assigns priorities among interrupt sources.   [8+8]

4. a) What is an auto reload timer? How do you program Timer 1 as an auto reload timer?
   b) What is a free running counter? Explain.   [8+8]

5. What is flash memory? Show and flash memory interfacing with 8051 microcontroller.   [16]

6. a) What is deadlock? How to avoid them?
   b) What is the difference between mailboxes and message queues?
   c) What do you understand from priority inversion problem in scheduling algorithm?   [4+6+6]

7. a) Explain the memory map in 80196 family MCU systems.
   b) List different flags available in 80196 microcontrollers and explain each of them.   [10+6]

8. a) Explain the main features ARM processors.
   b) List and explain different arithmetic instructions of ARM processor.   [8+8]

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Code No. N0423   **R07**   Set No.4

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Time: 3 hours   Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
*****

1. a) How is a microcontroller different from microprocessor? Explain main features of 8051 microcontroller.
   b) Explain the interrupt structure of 8051 microcontroller.   [8+8]

2. a) List and explain different data transfer instructions of 8051 microcontroller.
   b) List and explain different jump and branch instructions of 8051 microcontroller.   [8+8]

3. Explain the interrupt structure of 8051 microcontroller. Also explain how the 8051 handles multiple interrupts.   [16]

4. a) What is the difference between a timer and a counter? Explain.
   b) Explain the functions of TCON.0, TCON.1, TCON.2 and TCON.3 in the execution of external interrupt 0 and 1.   [6+10]

5. What is an LED? Show and explain how an array of LEDs can be interfaced with 8051 microcontroller.   [16]

6. Explain different software development tools for microcontrollers.   [16]

7. a) Explain IOC0 and IOS0 registers for timer 1 in 80196.
   b) What are the interrupt sources for synchronous serial transmission and reception in 80196? What are the identification flags and local enable bits for these sources?   [8+8]

8. What are the main features of ARM processor? Draw and explain the architecture of ARM processor.   [16]

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