Code No: R05410405 **Set No. 1**

IV B.Tech I Semester Regular Examinations, November 2008
MICRO CONTROLLERS AND APPLICATIONS
(Common to Electronics & Communication Engineering, Bio-Medical Engineering and Electronics & Telematics)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Draw the pin diagram of 8051 and explain the functioning of each and every pin. [16]
2. Explain in detail the function of CPU registers. [16]
3. (a) List out the interrupt system specifications.
   (b) Write a brief about multiple interrupt marking. [6+10]
4. (a) How do you set the TH&TL values for TIMER 0 in mode 0 operation?
   (b) How do you set the registers TH&TL when changing the frequency of operation? [8+8]
5. Use an 8-bit D/A converter which generaters 1000Hz sine wave. 166 decimal samples are stoled in a look up table and fed to the converter at a rate of one sample per 6 μ sec. The look uptable is pointed by DPTR and R_1 is used to count the samples. Write assembly language program to initialize the D/A converter which is interfaced to 8051. [16]
6. (a) Explain Round robin pre emptive multi-tasking algorithm.
   (b) Explain Interrrupt latency, interrupt response time and interrupt recovery time in real time operating system [8+8]
7. (a) What is a page address for a direct address of a register in 80196? What is the page address for a direct address of an internal memory? Can this address predefied?
   (b) Assume crystal frequency=12MHz Implement a time delay loop for the generation of 50ms delay using the instructions of 80196. Do not use timer of microcontroller. [8+8]
8. (a) How can we change the PSR contents through instructions in ARM? Explain different PSR instructions in ARM.
   (b) Explain how a constant is loaded into a general purpose register of ARM processor.
   (c) What is Thumb state? [6+6+4]

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

Answer any FIVE Questions
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1. Draw the block diagram of microcontroller and explain each block in detail. [16]
2. (a) Explain the working of 8051 oscillator and clock.
   (b) Explain the use of SFRS. [8+8]
3. Discuss the hardware and software attributes of vectored interrupts. [16]
4. Discus elaborately how does a high speed input unit works, with relevant diagram. [16]
5. (a) If a peumatic actuator is to be driven by a microcontroller, what kind of interface is needed?
   (b) What are the limitations in pulse counting in micro controller? How to count pulses appearing at a very high rate using microcontrollers? [8+8]
6. (a) What is deadlock? How to avoid them?
   (b) What is the different between mailboxes and message queces?
   (c) what do yout understand from priprity inversion problem in scheduling algorithm. [4+6+6]
7. (a) Why should the input to timer 2 from an external event be slower than 4μs? Assume a 12 MHZ crystal is available with 80196.
   (b) What is a high speed input (HSI) interupt? Why do we call it high speed? [10+6]
8. (a) Explain the complete ARM register set in different modes of ARM processor.
   (b) Explain how the change of modes take place in ARM? [8+8]

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Code No: R05410405 **Set No. 3**

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

Answer any FIVE Questions
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1. Draw the block diagram of 8051 and explain each block? [16]
2. (a) Write short notes on SFRS.
   (b) Write in detail about the instruction SJMP. [8+8]
3. Discuss the hardware requirements to needed to implement vectored or polled interrupts. [16]
4. Write what in the value (in hex) loaded into TH, TR, TF for to program timers for mode2.
   (a) MOV THO, #OOH
   (b) MOV TRO, #12H
   (c) usTFO, #BH. [16]
5. (a) Assume that a 2-digit BCD data is available in RegA, as a packed BCD number. Write an assembles code to drive 7 segment display driver subroutine to display the two digits one after another on single 7 segment display.
   (b) Expalin the LCD instructions. [8+8]
6. Give atleast two examples each of applications of semaphore, mailbox and message queue. [16]
7. (a) Explain the software times interrupt in 80196
   (b) Justify the priority orders provided in 80196 for the maskable interrupts
   (c) What are vector addresses for Interrept servicing to timer 1 and timer 2 in Intel 80196? [5+5+6]
8. (a) What is current program status register? Explain the generic structure of program status register as ARM core.
   (b) What are the various processor modes of ARM. What is thin order of privilage? Explain. [8+8]

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Code No: R05410405 **Set No. 4**

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the details of different kinds of memories given in 8051 microcontroller. [16]
2. Give any four examples for program control flow instruction and explain. [4×4]
3. How do you provide the mechanism so that a polled interrupt controller can receive two simultaneous interrupts in a system? [16]
4. Describe with examples various modes of the 8051 timers. [16]
5. (a) Write an algorithm for sending ASCII codes in a FIFO repeatedly upto maximum 32 times when a key is pressed for a duration more than 200ms. Key is repeatdly passed every 200ms. Write 8051 assembly routine also
   (b) Draw an interface for 3 scan lines and 5 return lines in a keypad. [8+8]
6. (a) Explain the importance of semaphores in multitasking system where task synchronization is achieved by this?
   (b) What are the various mutex management function calls in RTOS [8+8]
7. (a) Explain IOCO and IOSO register 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. (a) Explain different data processing instructions in ARM 7 (with examples).
   (b) What is Barrel shifter? How does it increase the speed of execution in ARM processor. [10+6]

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