

Code No: N0423/R07

Set No. 1

IV B.Tech I Semester Regular Examinations, November 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

1. Show interfacing mechanism that a 32 bit microcontroller can be used in image processing with an example. [16]
2. Write a program with assembly language to generate square wave. [16]
3. Narrate module coupling in interrupt service routine using 8051 interrupt structure. [16]
4. Narrate how you can program TINEO and TIMER1 in 8051C. [2×8]
5. A transducer interfaces an 8 bit ADC of an MCU and output to the LED display unit. Transducer generates 5mv/kmph car speed in an automobile. Lower limit of the car speed is Kmph and upper limit is 120kmph. The speed display is on four 7 segment LED display units: Draw the interface circuit for the above design and generate an assembly code to initialize the operation. [16]
6. (a) What is meant by context switching? Explain with an example
(b) Explain the Non-pre emptive multitasking technique with an example [8+8]
7. (a) List non-maskable and maskable interrupts in 80196
(b) Draw an interrupt vector table according to hardware priority of each source group. [8+8]
8. (a) Explain the registers available in different modes of ARM processor operation.
(b) Explain the pipeline structure of ARM 7. [8+8]

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1. Bring out the functional difference between microprocessors and microcontroller by drawing their basic block diagrams. [16]
2. Give any four examples for interrupt control flow instruction and explain. [4×4]
3. Discuss briefly nested interrupts. [16]
4. What are the steps involved in MODE1 programming and give an example? [16]
5. What do we mean by the bipolar mode of ADC? Discuss how the ADC results are stored in 8051 memory. What is the effect of finite word length of registers in microcontrollers. [16]
6. A multi-tasking system sends the message of 100 bits/minute at UART port(1 start+8data+1stop) at 1200 baud to a remote system. This message returns an identical message after 32ms if the remote system is good. List the tasks, which RTOS functions are used in this system [16]
7. (a) How is a watch dog timer used in 80196? How do we disable a watchdog timer feature in a program? When do we need to disable it?
(b) Explain PWM-control register of Intel 80196. How can we get a duty cycle of 25% at the PWM output using PWM-control? [8+8]
8. (a) Draw and explain the ARM core dataflow model.
(b) What are the various condition flags in ARM? [8+8]

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1. How do you do interface keyboard to the given 8051, give the block diagram also interface? [16]
2. Write a program to do all logical operations on any two numbers. [4×4]
3. (a) How do you access RAM locations 30-7FH as search pad?
(b) Write short notes on indexed addressing mode. [8+8]
4. (a) Find the timer's clock frequency and its period for various 8051-based systems with the following frequencies.
 - i. 8MHz
 - ii. 4MHz
 - iii. 16MHz.(b) Write about GATE in TMOD register. [8+8]
5. A transducer interfaces an 8 bit ADC of an MCU and output to the LED display unit. Transducer generates 5mv/kmph car speed in an automobile. Lower limit of the car speed is Kmph and upper limit is 120kmph. The speed display is on four 7 segment LED display units: Draw the interface circuit for the above design and generate an assembly code to initialize the operation. [16]
6. (a) What are the advantages of dividing an application into multiple tasks? What is a task control block?
(b) Explain the mailbox. Show how a task sends message to another task waiting for the message to start. Also show how a task sends a message pointer to another task waiting for that to start [6+10]
7. (a) How do we program baud rates during the UART functions in 80196?
(b) How do we program a software timer for an interrupt after 4.096 ms in 80196 using a crystal of 12 MHz? [8+8]
8. (a) Explain the pipeline executing characteristics of ARM? Take an example ARM instruction sequence and explain?
(b) Explain the difference between Exception handling & Interrupt handling in ARM. [10+6]

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1. (a) Write about capture registers.
(b) Write about control registers. [8+8]
2. (a) Write a program to add data in memory location and data in register.
(b) Write short notes on instruction set of 8051. [8+8]
3. (a) How do you access RAM locations 30-7FH as search pad?
(b) Write short notes on indexed addressing mode. [8+8]
4. Write short notes on the following:
(a) Free running counter.
(b) Interrupt interval. [2×8]
5. (a) A lookup table is used in the program "codekey". It uses 120 bytes to form a table for the valid keys. Write a subroutine using a series of "CJNE" instructions that will obtain the same result.
(b) When are the scan lines, encoded scan lines and return lines used? [8+8]
6. (a) Define task, task characteristics, task priority and task state
(b) Describe the RTOS functions in RTX5 tiny. [8+8]
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 Interrupt servicing to timer 1 and timer 2 in Intel 80196? [5+5+6]
8. (a) What are the Thumb version load-store multiple instructions? Explain them with example.
(b) Explain how Thumb state changes to ARM state and vice versa. [8+8]
