

IV B.Tech I Semester(R05) Regular/Supplementary Examinations, December 2009  
MICRO CONTROLLERS AND APPLICATIONS  
(Common to Electronics & Communication Engineering, Bio-Medical Engineering)  
Time: 3 hours Max Marks: 80  
Answer any FIVE Questions  
All Questions carry equal marks

**KOTTAM**  
INSTITUTIONS

1. Mention any two microcontrollers and bring out the advantages and disadvantages of one over the other.[16]
2. Give any four examples for interrupt control flow instruction and explain. [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. Write what in the value (in hex) loaded into TH, TR, TF for to program timers for mode2.  
(a) MOV TH0, #00H  
(b) MOV TRO, #12H  
(c) usTFO, #BH. [16]
5. How can we rotate satellite dish axis by 30° from the present angular position using a stepper motor and 8051 microcontroller? Design a suitable circuit and write assembly language code for 8051. The step angle is 1.8° assume current position is 0°. [16]
6. (a) Describe the functions of IDE(Integrated Development environment)  
(b) What are the development phases in a project? Explain the software development cycle for a project.[8+8]
7. (a) What is an internal RAM in microcontroller? How does it differ from the addressable registers in a microcontroller 80196. Do these occupy a common space?  
(b) What are the differences between a Harvard architecture and a Princeton architecture? Is it possible to have externally a processor Princeton architecture for its buses and internally the Harvard architecture?[8+8]
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]

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1. Draw the block diagram of microcontroller and explain each block in detail. [16]
2. (a) For a system 11.0592MHz. Find the time delay in the following subroutine.
 

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      DELAYMachinecycle
      Mov R2, 2001
      AGAIN: Mov R3, 2501
      HERE:NOP1
      NOP1
      DJNZ R3, HERE2
      DJNZ R2, AGAIN2
      RET2
      
```

 (b) For the given AT8051 system of 11.0592 Hz. Find the delay of the following instruction.
  - i. DJNZ, R2 target
  - ii. NOP
  - iii. MULAB
  - iv. RET
  - v. CPLA
  - vi. PUSH 4. [10+6]
3. (a) Write a program to transfer data from register to pin 1.7 in the given program.  
 (b) Write a short notes of transferring data of a RAM using bit addresses. [8+8]
4. What are the steps involved in MODE1 programming and give an example? [16]
5. Draw a neat interface circuit that controls the speed and direction of a DC motor. Explain the operation of this circuit that controls the angle/movement of the servomotor.[16]
6. How do we initiate round robin time slice scheduling? Give atleast two examples of the need for round robin scheduling.[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) 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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1. Write in detail about TIMERS in 8051. [16]
2. (a) Discuss 8051 data types.  
(b) 8051 registers. [8+8]
3. How do you provide the mechanism so that a polled interrupt controller can receive two simultaneous interrupts in a system?[16]
4. (a) Give procedure to reset TMOD register.  
(b) Does programming TMOD register effects PSW? It so how? [8+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 multi-tasking system sends the message of 100 bits/minut 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) List the special function registers of 80196. How does 26 byte addresses accommodate more than 26 special function register bytes?  
(b) Describe the function of HSO and HSI unit in 80196 [8+8]
8. (a) Explain four different branch instructions of ARM. Use an example to explain the instruction.  
(b) What are the various multiple-register transfer instructions in ARM. What are its addressing modes in ARM.[16]

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1. (a) What are XTAL1 and XTAL2 pins and what are their functions.  
(b) Write about EA/VPP pin. [8+8]
2. Discuss in brief about the instruction for reading input ports. [16]
3. (a) Write a program to transfer data from register to pin 1.7 in the given program.  
(b) Write a short notes of transferring data of a RAM using bit addresses. [8+8]
4. How does the register in timers1 can be programmed in bit addressable? [16]
5. (a) Write the help of a block diagram explain the parallel port interface for the printer, also use RS-232 serial interface and explain.  
(b) Write brief note on IEEE 488 GPIB signals. [8+8]
6. (a) Describe the functions of IDE(Integrated Development environment)  
(b) What are the development phases in a project? Explain the software development cycle for a project.[8+8]
7. (a) How do we program bud rates during the UART functions in 80196?  
(b) How do we program a software timer for an interupt after 4.096 ms in 80196 using a crystal of 12 MHz?[8+8]
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 prilivage? Explain. [8+8]