

Code No: 2420203

IV B. Tech II Semester Regular Examinations, April/May 2009

**EMBEDDED SYSTEMS
(Electrical & Electronics Engineering)**

Time: 3 Hours

Max. Marks 80

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

1. Explain in detail about the design considerations, simulation and Analysis Performed during the process of embedded system design with suitable example. (16M)
2. Describe the various operating modes of timer/counters and associated control registers of the 8051 microcontroller. (16M)
3. (a) List out the Boolean bit-level operations. (8M)
(b) Write an assembly language program to double the number in register R2 and put the result in registers R3(high byte) and R4(low byte). Also write comment on this (8M)
4. (a) Explain with suitable example, how to perform unconditional jumps using relevant mnemonics. (8M)
(b) Write an assembly language program for the data given below:
If the lower nibble of any number placed in A is larger than the upper nibble, set the C flag to 1, otherwise clear it. Place comments on each line of code. (8M)
5. Explain the concept of interfacing an LCD to the 8051 microcontroller with neat diagram. (16M)
6. (a) Explain the uses of semaphore Flag or Mutex as Resource Key. (8M)
(b) What is meant by pipe? How does a pipe differ from a queue? . (8M)
7. With suitable embedded system example, explain how laboratory tools are utilized for design using RTOS. (16M)
8. (a) Explain about the data transfer on the I²C Bus with suitable timing diagrams. (10M)
(b) List out the specifications of I²C Bus Protocol. (6M)

Code No: 2420203**IV B. Tech II Semester Regular Examinations, April/May 2009****EMBEDDED SYSTEMS
(Electrical & Electronics Engineering)****Time: 3 Hours****Max. Marks 80****Answer any FIVE questions
All questions carry equal marks***********

1. (a) Explain about embedded processor for a complex system. (8M)
(b) Explain the importance of the following processors in embedded Systems.
(i) Digital signal processor (ii) ASSP (8M)
2. (a) Explain the following, relevant to serial data input/output in 8051 Microcontroller.
(i) Serial data interrupts. (ii) Data Transmission and Reception. (8M)
(b) Briefly discuss about serial data transmission modes performed in 8051 Microcontroller. (8M)
3. (a) Explain the bit-level logical operations with suitable examples. (8M)
(b) Write an assembly language program to OR the contents of port 1 and 2 and put the result in external RAM location 0100h. Also write comment on this. (8M)
4. (a) Explain the following terms relevant to calls and subroutines:
(i) Subroutines (ii) Calls and the stack (iii) Calls and returns (8M)
(b) Write a simple subroutine, call it, and jump back to the calling program after adjusting the stack pointer. (8M)
5. (a) Define analog and digital ground. (6M)
(b) Draw the pin diagram for ADC804 chip and briefly explain how it will act as analog to digital converter. (10M)
6. (a) Write short notes on Message Queues. (8M)
(b) Explain how Message Queues are used for communication among processes. (8M)
7. (a) What are the various Embedded Software Development Tools available for testing Host and Target machines? (8M)
(b) Explain the procedure for getting Embedded software into the target System. (8M)
8. (a) Explain the design approach of an Elevator Controller. (8M)
(b) Write notes on Internet-Enabled Systems. (8M)

Code No: 2420203**IV B. Tech II Semester Regular Examinations, April/May 2009****EMBEDDED SYSTEMS
(Electrical & Electronics Engineering)****Time: 3 Hours****Max. Marks 80****Answer any FIVE questions
All questions carry equal marks**

1. (a) Define the terms 'System' and an 'Embedded system'. (4 M)
(b) Explain the components of embedded system hardware (8 M)
(c) Give the classification of embedded systems. (4 M)
2. (a) Explain about IE and IP function registers relevant to 8051 microcontroller Interrupts. (8M)
(b) Discuss about external interrupts and software generated interrupts in 8051 microcontroller. (8M)
3. (a) Explain about byte-level AND, OR, XOR and NOT Boolean instructions. (8M)
(b) Write an assembly language program to add two 16-bit numbers. The numbers are 2E5Fh and A3B4h. Store the sum in R7 and R6. R6 should have the lower byte. Also write comment on this. (8M)
4. (a) Explain the concept of interrupts and returns with suitable example. (8M)
(b) Assuming the crystal frequency is 10 MHz, write a program that will use timer 1 to interrupt the program after a delay of 2ms. (8M)
5. (a) Develop an interfacing circuit of 8051 microcontroller to ADC804 with self clocking method. (8M)
(b) Develop an interfacing circuit of 8051 microcontroller to ADC804 with clock from XTAL2 of the 8051 microcontroller. (8M)
6. (a) Write notes on Mailboxes. (6M)
(b) Explain the IPC Functions for creating and using the mailboxes as message Pointers. (10M)
7. (a) Explain the role of Linker or Locators for an Embedded software. (8M)
(b) Briefly explain the Debugging Techniques employed in an Embedded System. (8M)
8. (a) What is meant by CAN Bus? List out the features of CAN Bus. (8M)
(b) What are the applications and specifications of CAN Bus. (8M)

Code No: 2420203**IV B. Tech II Semester Regular Examinations, April/May 2009****EMBEDDED SYSTEMS****(Electrical & Electronics Engineering)****Time: 3 Hours****Max. Marks 80**

Answer any FIVE questions
All questions carry equal marks

1. (a) List the advanced microprocessors and microcontrollers used in the embedded systems. (6 M)
- (b) What are the functional circuits in a chip or core of microcomputer? in an embedded system. Explain them in brief. (10 M)
2. (a) Draw the pin out diagram of the 8051 microcontroller and Abbreviate the names of the signals for each pin. (8 M)
- (b) Draw the circuit diagram of the 8051 microcontroller oscillator and Explain the concept of 8051 timing. (8 M)
3. (a) Explain how to perform testing programs using a personal computer. (8 M)
- (b) Explain how to perform testing programs on a single-board computer. (8 M)
4. (a) Explain with suitable example, how to perform decimal arithmetic operation using Relevant mnemonics. (8M)
- (b) Write an assembly language program to get hex data in the range of 00-FFh from the port 0 and convert it to decimal. Save the digits in R7, R6 and R5, where the LSB is in R7. Place comments on each line of code. (8M)
5. Explain the importance of TI flag and RI flag in serial data communication.(16M)
6. (a) Differentiate the terms OS and Real Time OS with respect to various Features. (8M)
- (b) Explain in brief about RTOS Features. (8M)
7. (a) Explain the hard real-time Scheduling Considerations. (8M)
- (b) Explain the tools availability in various RTOS. (8M)
8. What are the various Working modes of I²C Bus and explain them with suitable Schematic diagrams. (16M)