

Code No. N0522**R07****Set No.1****IV B.Tech I Semester Supplementary Examinations, February/March, 2012****EMBEDDED SYSTEMS****(Common to Computer Science & Engineering and Information Technology)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain in brief, the sources that can be used for an embedded systems design. [8]
b) Explain the components of embedded system hardware. [8]
2. a) Explain the following, relevant to serial data input/output in 8051 microcontroller. Serial data interrupts. Data transmission and Reception. [8]
b) Describe the operating modes of timer of 8051 microcontroller. [8]
3. a) Discuss about Boolean bit-level operations with relevant examples. [8]
b) Write notes on microcontroller programming languages. [8]
4. a) Explain how to perform unsigned multiplication using relevant mnemonics. Give an example. [8]
b) Write an assembly language program to add the byte in external RAM location 02CDh to internal RAM location 19h and put the result in to external RAM locations 00C0h(LSB) and 00C1h(MSB). Give the comment on each line of code. [8]
5. a) Elaborate the procedure required for programming the 8051 microcontroller to transfer the data serially. [8]
b) Write an algorithm to send data from 8051 microcontroller to the LCD with checking busy flag. [8]
6. a) Explain the terms 'operating system' and 'Real-Time operating system' with respect to various Features. [8]
b) Write notes on tasks and task states relevant to RTOS. [8]
7. a) Explain the operating system units in an RTOS kernel. [8]
b) What does embedded Software development mean? Explain in brief, the different stages in the development and testing of an application. [8]
8. a) Explain the concept of data transfer on the I²C Bus with suitable timing diagrams. [8]
b) What is meant by instruction level parallelism? Explain, in brief. [8]

Code No. N0522**R07****Set No.2****IV B.Tech I Semester Supplementary Examinations, February/March, 2012****EMBEDDED SYSTEMS****(Common to Computer Science & Engineering and Information Technology)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
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1. a) Define the terms 'System' and an 'Embedded system'. Give the classification of embedded systems. [8]
b) Explain the importance of the following processors in embedded systems.
(i) Digital signal processor (ii) ASSP [8]
2. a) Explain in brief, the different operating modes of the UART. [8]
b) Tabulate the special function registers by making four columns as register, bit, primary function and bit addressable. [8]
3. a) Explain the bit-level logical operations with suitable examples. [8]
b) Write an assembly language program to double the number in register R2 and put the result in register R3 (high byte) and R4 (low byte). Also write comment on this. [8]
4. a) Explain with suitable example, how to perform bit jumps using relevant mnemonics. [8]
b) Write an assembly language for the following data.
Find the address of the first two internal RAM locations between 20h and 60h which contain consecutive numbers. If so, set the carry flag to 1, else clear the flag. Place comments on each line of code. [8]
5. With neat sketch explain the design approach of interfacing with keyboard with Display unit to 8051 microcontroller based embedded system. Write down the necessary source code. [16]

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6. a) With an example, explain the concept of deadlock situation during multitasking execution. [8]
b) Explain Inter Process Communication with an example. [8]
7. a) Explain in brief, the principles of basic embedded system design using RTOS. [8]
b) Discuss the advantages of time slice scheduling required for an RTOS. [8]
8. a) Differentiate the ARM and SHARC processor architectures with respect to various features. [8]
b) Write short notes on CAN Bus protocol. [8]

FirstRanker

Code No. N0522**R07****Set No.3**

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Answer any FIVE Questions
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1. a) Define an embedded system architecture and present its impact in an embedded system design. [8]
b) Draw the layered embedded system model and explain about each layer. [8]
2. a) Explain about IE and IP function registers relevant to 8051 microcontroller interrupts. [8]
b) Discuss about external interrupts and software generated interrupts in 8051 microcontroller. [8]
3. a) Explain how to understand the assembler program. Discuss about assembler directives. [8]
b) Explain the following terms, relevant to programming the 8051 microcontroller.
i) Lines of code ii) Instructions [8]
4. a) Explain about the jump and call program ranges with suitable diagram. [8]
b) Write an assembly language program to increment the contents of RAM locations 13h, 14h and 15h using indirect addressing. Place comments on each line of code. [8]
5. Write an algorithm and source code to send commands and data from 8051 microcontroller to LCDs with a required time delay. [16]
6. a) Explain the uses of semaphore flag or mutex as resource key. [8]
b) What are the different scheduling methods used to control Task State Transition? Explain any one method in detail. [8]
7. a) What is meant by Real Time Operating System? List out the different available RTOS. [8]
b) Explain the tools availability in various RTOS. [8]
8. a) Explain the design approach of an Elevator Controller. [8]
b) Give the features and a comparison of exemplary high performance ARM family of processors. [8]

Code No. N0522**R07****Set No.4**

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Answer any FIVE Questions
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1. a) Explain about embedded processor for a complex system. [8]
b) What are the techniques of power and energy management in an embedded system? Explain them in brief. [8]
2. a) Briefly discuss about serial data transmission modes performed in 8051 microcontroller. [8]
b) Explain about TCON and TMOD function registers relevant to counters and timers of the 8051 microcontroller. [8]
3. a) List out and explain in brief, Boolean bit-level operations. [8]
b) Assume that register A has packed BCD. Write an assembly language program to convert packed BCD to two ASCII numbers and place them in R2 and R6. Write comment on this. [8]
4. a) Explain with an example, how to perform decimal arithmetic operation using relevant mnemonics. [8]
b) Write an assembly language program for the following data given below:
The number A6h is placed somewhere in external RAM between locations 0100h and 0200h. Find the address of that location and put that address in R6 (LSB) and R7 (MSB). Give comments on each line of code. [8]
5. With the aid of neat diagram the design approach of interfacing Digital-to-Analog converter to 8051 microcontroller based embedded system. Write down the necessary program. [16]

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6. a) Explain the problem of sharing data by multiple tasks and routines. [8]
b) What is meant by pipe? How does a pipe differ from a queue? Give an example. [8]
7. a) Explain the hard real-time Scheduling Considerations. [8]
b) Write notes on memory management organization of RTOS. [8]
8. a) Give the features and a comparison of exemplary high performance ARM family of processors. [8]
b) With the aid of CAN bus protocol receiver architecture explain any one of the module associated with it. [8]