Code No: 07A7EC38   **R07**   **Set No. 2**

IV B.Tech I Semester Examinations,May 2011
EMBEDDED AND REAL TIME SYSTEMS
Common to Bio-Medical Engineering, Instrumentation And Control
Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) What is priority inversion problem and explain about it.
   (b) Explain how to Query a memory block and free the memory block.   [8+8]

2. (a) Define hardware/Software Co-Simulator.
   (b) What is a key method for speeding up such simulator?   [8+8]

3. (a) With the help of any two examples explain simple concurrent process.
   (b) Explain about HCFSM and the Statecharts Language.   [8+8]

4. (a) Illustrate how program and data memory fetches can be overlapped in a Princeton architecture.
   (b) Explain about Memory Data Bus and Address Bus with neat diagram. [8+8]

5. Explain about RS232 and UART?   [16]

6. (a) Explain about sequential logic design.
   (b) Explain RT-Level custom single purpose processor design.   [8+8]

7. With respect to embedded RTOS compare among the following :

   (a) Mailbox
   (b) Message queue
   (c) Event Register
   (d) Pipes.   [4+4+4+4]

8. With suitable examples explain how do you :

   (a) Acquire a Semaphore
   (b) Release a Semaphore
   (c) Query a Semaphore.   [5+5+6]

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Code No: 07A7EC38 **R07** **Set No. 4**

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Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
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1. (a) Explain the system Synthesis.
   (b) Explain how emulators solve problems associated with simulators.   [8+8]

2. (a) Explain about Dataflow Model.
   (b) Explain about Producer - Consumer example with monitors.
   (c) Explain about Concurrent Processes.   [4+4+8]

3. (a) Explain about the communication between nodes in wireless LAN.
   (b) Explain about Bluetooth System and its Specifications.   [8+8]

4. With suitable examples explain how to:
   (a) Close a Pipe
   (b) Read a Message from the pipe
   (c) Write to the Pipe.   [5+5+6]

5. (a) Explain the specialties of Embedded Systems.
   (b) Explain the recent trends in Embedded Systems.   [8+8]

6. List the features of the embedded Linux and compare embedded Linux with other RTOS.   [16]

7. Suppose that your system has two ROM chips and two RAM chips whose sizes and addresses are as shown in the following table. Design a decoder circuit that takes appropriate chips address lines as inputs and produce the chip selcet signals for each of these four memory parts.   [16]

	Size	Low Address	High Address
ROM	128 KB	0x00000	0x1FFFF
ROM	128 KB	0x20000	0x3FFFF
RAM	64 KB	0x80000	0x8FFFF
RAM	64 KB	0x90000	0x9FFFF

8. For each of the following situations, discuss which of the three shared data protection mechanisms seems mose likely to be best and explain why?

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(a) Task M and Task N share an int array, and each often must update many elements in the array

(b) Task P shares a single char variable with one of the interrupt routines. [8+8]

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FIRSTRANKER

Code No: 07A7EC38 | R07 | Set No. 1

IV B.Tech I Semester Examinations,May 2011
EMBEDDED AND REAL TIME SYSTEMS
Common to Bio-Medical Engineering, Instrumentation And Control Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

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1. Draw and explain the basic architecture of a microprocessor.   [16]

2. (a) List various application areas of Embedded Systems and give examples for each application area.

   (b) Give overview of Embedded System architecture.   [8+8]

3. (a) Explain about USB.

   (b) Explain briefly about RS232 and UART.   [8+8]

4. (a) Explain the difference among various types of off - the shelf operating systems.

   (b) Explain any three POSIX system calls with proto-type and give example for each.   [10+6]

5. What is a Gajski Y chart? How this chart is important in the design of an embedded System.   [16]

6. With suitable examples explain how to:

   (a) Post a message in a Message Queue

   (b) Read a message from message queue

   (c) Show queue waiting list.   [5+5+6]

7. (a) Explain about Dataflow model.

   (b) Write and explain C program providing solution to the Consumer-producer problem.   [8+8]

8. Taking suitable examples explain how to :

   (a) Acquire a Mutex

   (b) Query a Mutex

   (c) Wait on a Mutex.   [5+5+6]

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Code No: 07A7EC38 | **R07** | **Set No. 3**

IV B.Tech I Semester Examinations,May 2011
EMBEDDED AND REAL TIME SYSTEMS
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Time: 3 hours | Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Explain different states of tasks [8+8]
   (b) Explain about the following scheduling algorithms
      i. Primitive multitasking
      ii. Shortest-job first.

2. Explain the role of following tools in software development for Embedded Systems.
   (a) Instruction Set Simulators
   (b) In - circuit Emulators. [16]

3. (a) Explain the features of USB.
   (b) Give a note on Infrared communication. [8+8]

4. With suitable examples explain how to:
   (a) Query a Mailbox
   (b) Post a message in a Mailbox
   (c) Read message from a Mailbox. [5+6+5]

5. (a) Determine whether the following are synchronous or asynchronous.
      i. Multiplexer
      ii. Register
      iii. Decoder.
   (b) A subway has an Embedded System controlling the turnstile, which releases when the tokens are deposited.
      i. Draw the FSMD state diagram for this system.
      ii. Derive the FSM logic using truth tables and K - Maps to minimize logic.
      [3+3+3+7]

6. (a) Explain about Concurrent Process Model.
   (b) Explain briefly about embedded system example for Heartbeat Monitoring System. [8+8]

7. (a) Draw and explain Design cycles in the development phase for an embedded system

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(b) Describe complete specifications and system requirements of an embedded system.   [10+6]

8. Inter CPU motherboard is an embedded board. Assuming the RTOS is ported on to this board explain the following features of this board

   (a) Interrupt support

   (b) DMA support

   (c) Machine or Bus cycles

   (d) Memory.   [4+4+4+4]

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