Code No. L0421   **R07**   Set No.1

IV B.Tech II Semester Regular/Supplementary Examinations, April, 2012
EMBEDDED AND REAL TIME SYSTEMS
(Common To Electronics & Communication Engineering and Electronics & Instrumentation Engineering)

Time: 3 hours   Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. a) Explain the components of embedded system hardware.   [8]
   b) Explain with an example how to optimize custom single purpose processors. [8]

2. a) Explain the development environment of general purpose processors used in an embedded system design with an example.   [8]
   b) Explain the importance of the following processors in embedded systems.
        (i) Digital signal processor   (ii) ASSP   [8]

3. a) Describe program state machine model with relevant example.   [8]
   b) Discuss about concurrent processes.   [8]

4. a) What is meant by communication interface? Explain the need for communication interfaces.   [8]
   b) Illustrate with suitable example how to utilize Ethernet as a communication interface.   [8]

5. a) Explain the use of semaphores for the critical sections of a Task.   [8]
   b) Write notes on Task and Task States.   [8]

6. a) What is meant by priority Inversion problem? Explain it with an example. [8]
   b) What is meant by pipe? How does a pipe differ from a queue? Explain with an example.   [8]

7. a) Explain in brief, the different Timer Functions.   [8]
   b) Write notes on Windows CE.   [8]

8. Explain the following related to embedded system design technology.
   a) Behavioral Synthesis   [8]
   b) Hardware/Software co-verification   [8]

Code No. L0421   **R07**   Set No.2

IV B.Tech II Semester Regular/Supplementary Examinations, April, 2012
EMBEDDED AND REAL TIME SYSTEMS
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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'. Give the classification of embedded systems. [8]
   b) Write notes on RT-level custom single purpose processor design. [8]

2. a) Explain the concept of pipelining relevant to general purpose processors used in an embedded system design. [8]
   b) Write notes on application specific instruction-set processors. [8]

3. a) Describe finite state machines with data path model with relevant example. [8]
   b) Discuss about real-time systems. [8]

4. a) Explain the need for communication interfaces used in embedded systems. Consider UART as an example. [8]
   b) Illustrate IEEE 1394 Firewire protocol with suitable example. [8]

5. a) Explain the uses of semaphore flag or Mutex as resource key. [8]
   b) Explain the operating system units at an RTOS kernel. [8]

6. a) What are Message Queues? Explain how Message Queues are used for communication among processes. [10]
   b) Write notes on Mailboxes. [6]

7. a) What is meant by RTOS? Tabulate the various functions of RTOS with their activities. [8]
   b) Write notes on RT Linux. [8]

8. Explain the following related to embedded system design technology.
   a) RT Synthesis [8]
   b) Reuse of intellectual property codes [8]

Code No. L0421

Set No.3

R07

IV B.Tech II Semester Regular/Supplementary Examinations, April, 2012
EMBEDDED AND REAL TIME SYSTEMS
(Common To Electronics & Communication Engineering and Electronics &
Instrumentation Engineering)

Time: 3 hours   Max. Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
*****

1. a) Describe the design challenges in an embedded system design.   [8]
    b) Write notes on RT-level sequential logic of single purpose
       processors used in embedded system design.   [8]

2. a) Draw the basic architecture of general purpose processor and explain.   [8]
    b) Write notes on digital signal processors.   [8]

3. a) Describe the data flow model with relevant example.   [8]
    b) Elaborate the implementation procedure of an embedded system using state
       machine and concurrent process models.   [8]

4. a) Explain the need for communication interfaces used in embedded systems.
       Consider RS485 as an example.   [8]
    b) Illustrate Blue tooth technology with suitable example.   [8]

5. a) What are the states of a task? Explain the entity controlling the transitions
       from one state to another in a task?   [8]
    b) Explain how Tasks are different from functions and Interrupt Service Routines. [8]

6. a) Describe various message queue functions relevant to RTOS.   [8]
    b) Give different mailbox types, explain their initialization and other functions
       for a mail box at an RTOS.   [8]

7. a) Explain the principles of basic embedded system design using RTOS.   [8]
    b) Write notes on handheld operating systems.   [8]

8. Explain the following related to embedded system design technology.   [16]
       a) System Synthesis
       b) Hardware/Software Co-Simulation

1 of 1

Code No. L0421   **R07**   **Set No.4**

IV B.Tech II Semester Regular/Supplementary Examinations, April, 2012
EMBEDDED AND REAL TIME SYSTEMS
(Common To Electronics & Communication Engineering and Electronics & Instrumentation Engineering)

Time: 3 hours   Max. Marks: 80

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

1. a) Determine the term' an embedded system'. Discuss the components of
   embedded system hardware with neat diagram.   [8]
   b) Write notes on RT-level Combinational logic of single purpose processors
   used in embedded system design.   [8]

2. a) With the aid of architecture, explain the Application Specific Instruction-Set
   Processors.   [8]
   b) Explain how a DSP Processor differs from a general-purpose processor.   [8]

3. a) Describe the concurrent process model with relevant example.   [8]
   b) Discuss about Synchronization among processes.   [8]

4. a) Explain the need for communication interfaces used in embedded systems.
   Consider RS232 as an example.   [8]
   b) Give the specifications of USB and explain how to utilize it as a communication
   interface.   [8]

5. a) Draw and explain the architecture of the kernel.   [8]
   b) Write notes on semaphore functions related to RTOS concepts.   [8]

6. a) Explain how Message Queues are used for communication among processes.   [8]
   b) Explain how an operating system solves priority inversion problem by a priority
   inheritance mechanism.   [8]

7. a) Explain the situations, which lead to priority inversion problems.   [8]
   b) Write notes on Embedded Linux.   [8]

8. Explain the following related to embedded system design technology.   [16]
   a) Logic Synthesis
   b) Hardware/Software Co-Design