Code No: **R42057**

R10

IV B.Tech II Semester Regular Examinations, April/May - 2014
EMBEDDED AND REAL TIME SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   **Max. Marks: 75**
Answer any Five Questions
All Questions carry equal marks
*****

1 a) List various application areas of embedded systems and give examples for each
  application area?   [8]
 b) Write a short note on history of embedded systems.   [7]

2 a) Enlist the salient features of 8051 family of microcontrollers.   [7]

 b) Discuss the following signal descriptions of 8051
  i) ALE/PROG   ii) RXD   iii) TXD   iv) T0 and T1   [8]

3   Interface ADC 0801 with 8051 to convert -5V -0 +5V analog voltage to digital
  equivalent, draw hardware and write appropriate program?   [15]

4   Explain the following instructions with an example
  i) SWAP A ii) ADD A,B   iii) DIV AB   iv) MUL AB
  v) RL A   vi) XCHD A,R0   vii) MOV A,@R0   [15]

5 a) Explain different states of tasks.   [7]
 b) With suitable examples explain how to
      i)   Create a task
      ii)   Suspend a task   [8]

6 a) What is deadlock? What are the different conditions favouring deadlock?   [8]

 b) Give the merits and demerits of message based IPC?   [7]

7   Write short notes on the following
      a) Semaphores in RTOS
      b) Reentrancy and semaphores
      c) Mutex and binary semaphore   [15]

8 a) Explain about the primary objectives of embedded product development life
  cycle?   [8]
 b) Give the differences between product upgrades and Retirement/Disposal?   [7]

|"|'|"|'"|"||'"'||'|

Code No: **R42057**

R10

IV B.Tech II Semester Regular Examinations, April/May - 2014
EMBEDDED AND REAL TIME SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   **Max. Marks: 75**

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

1   Define the three main characteristics of embedded systems that distinguish them from other computing systems.   [15]

2   a)   Write an ALP to generate a year calendar using R_3 for date, R_4 for month and DPTR for year.   [8]
   b)   Discuss about the source current and sink current in 8051?   [7]

3   a)   Draw SCON and PCON special function registers and explain the functioning of each field.   [8]
   b)   Write short note on power saving modes?   [7]

4   a)   List the addressing modes of 8051 and explain register indirect and indexed Addressing mode in detail with assembly language example.   [7]
   b)   Explain following 8051 instructions with an example.
     (i) MOVX   (ii) ANL C, /Bit   (iii) CJNE   (iv) DIV   [8]

5   a)   What are the basic services provided by scheduler in RTOs? How scheduler in RTOs is different from scheduler in operating systems?   [10]
   b)   Write a short note on process management?   [5]

6   Write short note on:
    a) Message Queues
    b) Mail box
    c) Signaling   [15]

7   a)   With suitable examples explain how do you create and delete a semaphore.   [8]

   b)   Explain the inter locked functions for lock based mutual exclusion under windows OS?   [7]

8   a)   Explain the various instruction sets supported by ARM processor?   [8]

   b)   Write a short note on embedded OS trends.   [7]

|"|'|"|"|"||'"||'|

R10

IV B.Tech II Semester Regular Examinations, April/May - 2014
EMBEDDED AND REAL TIME SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   **Max. Marks: 75**
Answer any Five Questions
All Questions carry equal marks
*****

1   Explain the important features of any two embedded systems belong to each of the following areas of application.
   a) Consumer electronics
   b) Missiles and bombs in military
   c) Data communication
   d) Wireless communication   [16]

2 a) Draw and discuss the internal architecture of 8051.   [8]
   b) How does 8051 differentiate between the external and internal program memory?   [7]

3 a) What are the different modes of operation associated with a timer? Explain   [8]
   b) What is Interrupt recovery time and Interrupt response time? Explain in detail about the interrupt latency?   [7]

4 a) Explain following instructions of 51 family microcontroller with an example
      (i) DAA   (ii) DEC A   (iii) RRC A
      (iv) DEC @R0   (v) ADDC A,R7   [7]
   b) Explain the PUSH and POP operations on stack with examples?   [8]

5   Explain about the following scheduling algorithms:
      a) Round-robin with priority
      b) First-in-First-out
      c) Last-in-First-out   [15]

6 a) Give the different methods of handling dead locks.   [7]
   b) What is race condition? How it is related to the shared resource access using an example?   [8]

7 a) What do you mean by the integration of hardware and firmware? List the techniques used for the same.   [8]
   b) Give the differences between Semaphore and Binary Semaphore?   [7]

8   Write a short notes on
      a) Simulators   b) Emulators   c) Debuggers   [15]

|"|'|''|'"||''"'||'|

IV B.Tech II Semester Regular Examinations, April/May - 2014
EMBEDDED AND REAL TIME SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   **Max. Marks: 75**

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

1 a) What is an embedded firmware? What are the different approaches available for embedded firmware development? [8]
  b) Write a short note on PCB and passive components. [7]

2 a) Discuss the register set of MCS-51 family of microcontrollers. [8]
  b) Discuss the advantages of microcontroller based systems over microprocessor based systems? [7]

3   Interface ADC with Port2 of 8051 as data output lines of ADC. The ADC control lines will be implemented using P3 or P1 lines.
  a) Draw hardware and write program for the interfacing using polling of EOC signal
  b) Draw hardware and write program using INT1 driven by EOC signal [15]

4 a) Explain all the Boolean bit-level operations. [8]
  b) Classify the instruction set of 8051? [7]

5   Write short notes on:
  a) Preemptive multitasking
  b) Non- Preemptive multitasking
  c) Co-operative multitasking [15]

6 a) Explain the message passing technique for IPC? [8]
  b) List out the differences between Blocking communication and Non-Blocking communication? [7]

7 a) What is priority inversion problem? How the priority inversion problem can be handled? [8]
  b) Compare Buffer over-run and Buffer under-run with suitable examples? [7]

8 a) Explain the different phases of embedded product development life cycle. [8]
  b) Discuss briefly the various exceptions defined by ARM. [7]