

29/5/2012

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BE(ETRX) ~~VIII~~ Embedded System & Real time programming. 12.00 pm to 3.00 P.M.

Con. 4451-12.

(REVISED COURSE)

GN-8267  
[ Total Marks : 100

(3 Hours)

- N. B. : (1) Question No. 1 is **compulsory**.  
(2) Answer any **four** of the remaining **six** questions.  
(3) Draw **neat** diagram and assume **suitable** data wherever **required**.

1. (a) What is H/W and S/W co-design. 5  
(b) Explain functions of different registers available in ARM7. 5  
(c) Differentiate between Mutex, Lock () and Spinlock () inter process communications techniques with suitable example. 5  
(d) Draw and explain data frame format of CAN bus. 5
2. (a) Design an automatic Tea and Coffee vending machine based on FSM (Finite State Machine) Model for the following requirement the tea/coffee vending is initiated by user inserting a 5 rupee coin. After inserting the coin the user can either select coffee or tea or press cancel to cancel the order and take back the coin. 7  
(b) Draw and explain Petri net model. 3  
(c) Name different problems of using Semaphore, also explain priority inversion problem and its solutions. 10
3. (a) Draw and explain status register structure of MSP430. 5  
(b) Explain different Exceptions which occur in MSP430. 5  
(c) Describe clock circuit and registers used in control of MSP430. 10
4. (a) Define Process, Threads and Tasks also explain various status of task. 10  
(b) What is shared data problem and mention various methods to resolve it. (Give relevant example). 10
5. (a) Explain Processor modes of ARM7, also specify different branch instruction used to exchange branch from ARM mode to Thumb mode. 10  
(b) Explain different addressing modes of ARM7TDMI. 10
6. (a) Three Task with ids T1, T2, T3 with estimated time 10, 5, 7 ms and priority 1, 3, 2 resp. enters the ready Queue together. A new process T4 with estimated time 2 ms and priority 0 enters the ready queue after 2 ms. Schedule the tasks using preemptive SJF (shortest job first) and Priority based scheduling algorithm. Calculate execution time, waiting time, turnaround time, mention which is the best scheduling algorithm for a given problem. (0 is the highest priority). 10  
(b) Explain data structures Queue, Circular Queue, Linked list, Array. 10
7. Write short notes on any **four** : 20
  - (a) Explain System on chip (Soc)
  - (b) Spiral model used in EDLC
  - (c) Periodic and Aperiodic Rate Monotonic Scheduling
  - (d) Black box and White box testing
  - (e) SPI and SCI port.