B.E. (CST) Part-IV 8th Semester Examination, 2007

Real Time System Design

(CST-801)

Time : 2 hours **Full Marks : 50**

Answer any FOUR questions.

1. Describe system analysis techniques for real time systems. A hospital wants to monitor the critical patients through adequate instrumentation. Depict this as a real time system using (a) Petri Nets and (b) State charts. [6+3½+3]

2. RM (Rate Monotonic) algorithm is an optimal scheduling algorithm – explain. Derive a criterion for schedulability of two tasks with periodicity p_1, p_2 and execution times e_1, e_2 respectively; in terms of task utilization. Construct a numerical example to illustrate the criterion. [3+6+3½]

3. How does clock drift affect the speed of computers? Define clock skew. Show how clock skew can be estimated in absence and presence of propagation delays. [3+3+6½]

4. What are the merits and demerits of hardware synchronization of clocks? Describe the technique of hardware based synchronization. Show mathematically how it works. [3+6+3½]

5. Describe different software based clock synchronization techniques. Compare the algorithms from the point of view of fault tolerance. [9+3½]

6. Write short notes on : [6½+6]
   a) Correctness and Optimality of EDF scheduling algorithm
      (EDF = Earliest Deadline First)
   b) Design optimization issues in real time system.