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10EC842

Eighth Semester B.E. Degree Examination, July/August 2021
Real Time Operating Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1 a. What is meant by Embedded system? Explain briefly the history of embedded systems. (06 Marks)
b. Draw a polling state machine for a Real time services and write pseudo code for Real time services. (10 Marks)
c. List the POSIX group standards related to Real time systems. (04 Marks)
- 2 a. Write the state Transition diagram and state transition Table for a thread of execution including all possible states. (08 Marks)
b. Describe the Real time service utility functions with graphs and examples. (12 Marks)
- 3 a. Derive RM-LUB equation considering two critical cases with timing diagrams and relationship graphs for T_1 and T_2 (12 Marks)
b. Differentiate between preemptive and non-preemptive scheduling. (08 Marks)
- 4 a. Explain briefly: i) Pipelining Technique ii) Physical memory hierarchy. (08 Marks)
b. Explain ECC memory Design using hamming code the data byte is $(11000100)_2$ write calculation for forming encoded data and for corrected data. Write the calculation and correction if D_5 is changed during transmission. (12 Marks)
- 5 a. Explain Blocking, Deadlock and Livelock. (10 Marks)
b. What is meant by Priority Inversion? Explain the unbounded priority inversion solutions. (10 Marks)
- 6 a. What is meant by missed deadlines? Explain how these missed deadlines can be handled. (08 Marks)
b. Explain the RTOS system software mechanisms. (12 Marks)
- 7 a. Explain Single step Debugging. (08 Marks)
b. Explain basic concepts of Drilldown tuning. Explain performance profile data concept with neat sketch. (12 Marks)
- 8 a. Explain Reliability and Availability in RTOS design. (10 Marks)
b. Explain the features of PIC microcontrollers. (04 Marks)
c. What are the issues to be considered for the design of RTOs using a PIC microcontroller? (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.