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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Second Semester, M. Tech - VLSI Design and Embedded System (MECE)

Semester End Examination; May/June - 2018

Real Time Systems

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1	a.	Explain Release times, Deadlines and Timing constraints.	6
	b.	With the help of block diagram, explain scheduling hierarchy.	6
	c.	Discuss Hard timing constraints and Temporal quality of service guarantees.	8
2	a.	Discuss the concept of Hard Real Time Systems.	6
	b.	Explain the following : i) Preemptivity of jobs ii) Criticality of jobs	6
	c.	Differentiate Hard and Soft Real Time Systems.	8

UNIT - II

3	a.	Discuss effective Release Times and Deadlines.	6
	b.	Explain Priority driven approach in real time scheduling.	6
	c.	Explain general structure and characteristics of cyclic schedules in detail.	8
4	a.	Differentiate off-line scheduling and on-line scheduling.	6
	b.	Explain Timer driven scheduler with pseudo code.	8
	c.	Discuss EDF and LST Algorithms.	6

UNIT - III

5	a.	Explain Rate-Monotonic algorithm with example.	6
	b.	Differentiate between fixed priority and dynamic priority algorithms.	6
	c.	Discuss optimality of the RM and DM algorithm.	8
6	a.	Find the length of an in phase level-3 busy interval of the following fixed priority tasks : $T_1 = (5, 1)$, $T_2 = (3, 1)$, $T_3 = (8, 1.6)$ and $T_4 = (18, 3.5)$.	8
	b.	Discuss Schedulability test for the EDF algorithms.	6
	c.	State how response time varies with respect to the type of scheduling in an RTS?	6

UNIT - IV

7	a.	Discuss the rules of the basic priority inheritance protocols.	6
	b.	Explain deadlock avoidance by priority-ceiling protocol with example.	8
	c.	Describe the process of resource access control as applied to Real Time Systems.	6

Contd…2

8 a. Write a note on ceiling protocol. 8

b. Discuss non-preemptive critical section in Real Time Systems. 6

c. Differentiate between priority inheritance and priority ceiling protocols. 6

UNIT - V

9 a. Explain the following :

i) Job shops and flow shops ii) End-to-End Timing constraints 8

iii) Periodic End-to-End Tasks iv) Parallelism

b. Discuss RMFF algorithm with example. 6

c. Write a note on deadline assignment algorithms. 6

10 a. Explain prioritized access in IEEE 802.5 token rings. 6

b. Explain a model of real time communication system. 6

c. Write a note on performance objectives and constraints. 8

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