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

(An Autonomous Institution affiliated to VTU, Belagavi)

Second Semester, M. Tech - Computer Science and Engineering (MCSE)

Semester End Examination; June - 2017

Real Time Operating System

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a. Discuss Precedence constraints and data dependency. 10

b. Explain clock driven and priority driven approaches to scheduling real time systems. 10

2 a. With reference to Air traffic/flight discuss High level controls. 10

b. With examples, explain hard real time systems and discuss why hard timing constraints are imposed? 10

UNIT - II

3 a. Explain the general structure of cyclic schedules. 10

b. Distinguish between Fixed priority and Dynamic priority algorithms. 10

4 a. Discuss scheduling of sporadic jobs. 10

b. Explain how one can deduce how large the total utilization of a system has to be in order for the system to the securely schedulable? 10

UNIT - III

5 a. Write a note on Non-preemptive critical sections. 10

b. Explain the Bandwidth preserving servers that are designed to improve over a deferrable server. 10

6 a. Differentiate between Priority-Inductance and Priority ceiling protocols. 10

b. Discuss the following :

i) Background and Interrupt driven execution versus Slack stealing 10

ii) Polled executions versus Bandwidth preserving services.

UNIT - IV

7 a. Demonstrate hardware interfacing from software/system engineering perspective for real time systems. 10

b. Discuss Architectural enhancements that can improve the performance of Real time systems. 10

8. Explain : i) FPGA ii) Non-Von Neumann Architectures. 20

UNIT - V

9 a. With a neat figure illustrate the Role of the Kernel in operating systems 10

b. Discuss the different types of dynamic allocation. 10

10 a. Illustrate the usage of Semaphores as a methodology for protecting critical regions. 10

b. Explain the Task control Block model and main memory issue associated with it. 10

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