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

(An Autonomous Institution affiliated to VTU, Belgaum)

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

Semester End Examination; Jan/Feb. - 2016

Advances in Operating Systems

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a. What is a system call? Illustrate with a suitable algorithm and show how process is created. 10

b. Distinguish between monolithic and microkernel. 5

c. Write a note on Linux kernel versions. 5

2 a. Give flow chart and explanation for process states in Linux. 10

b. In detail explain the following : 10

i) Process descriptor and the Task structure ii) Process Termination.

UNIT - II

3 a. Write short notes on : 10

i) Process priority ii) Time slice

b. What is load balancer? Describe the various steps of load balance function. 10

4 a. Explain the following concept in detail : 10

i) Preemption and context switching ii) Linux's process scheduler

b. What are scheduler related systems calls? Explain scheduling policy, priority related system calls and processor affinity system calls. 10

UNIT - III

5 a. Explain the working of system call Handler. 10

b. What are interrupts? Write the importance of interrupts. 6

c. Distinguish between top halves and Bottom halves interrupt handler. 4

6 a. Explain the concept of writing an Interrupt handler. 10

b. Write a note on : 10

i) Interrupt context ii) System call context

UNIT - IV

7 a. Define critical region and race condition. How locking method is used in Kernel synchronization. 10

b. Give explanation with special context to Linux : 10

i) Dead locks ii) Contention and scalability.

8 a. Discuss the following : 10

i) Atomic operations ii) Reader writer semaphores

Contd….2

b. Explain the following : 10

i) Hardware clocks and Timers ii) The Timer Interrupt handler.

UNIT - V

9 a. With a diagram explain the relationship between Caches, Slabs and objects. 10

b. What is paging? Explain various allocation and deallocation functions used in Linux memory management. 10

10 a. Give explanation with special context to Linux :

i) High memory mappings 10

ii) Picking an allocation method

b. Why do we need Zones in memory management? Explain the various zones used in Linux memory management. 10

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