M.E. First Semester (Information Technology) (Full Time) (C.G.S.)

13418 : Operating System Configuration

1 NMEF 1

P. Pages : 2

Time : Three Hours

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AW - 3741

Max. Marks : 80

Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.
3. Use of non programmable calculators is permitted.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) With the help of neat diagram, describe the kernel structure in Linux indicating various components like processor management, memory management etc. **8**

b) Differentiate between : **6**
i) Device driver and device controller.
ii) Task and Thread
iii) Multiprogramming and Multiprocessing.

OR

2. a) Give and explain the meaning of system context, address context and hardware context with reference to Linux. **7**

b) What is meant by thread. Explain how threads are implemented in Linux ? **7**

3. a) Differentiate between : **6**
i) Interrupt ( ) and trap ( ) system call
ii) Fork ( ) and exec ( ) system call
iii) Sleep ( ) and wait ( ) system call

b) What is meant by interrupt ? Describe typical structure of the interrupt handler under Linux. **7**

OR

4. a) Differentiate between : **6**
i) Preemptive and non-Preemptive scheduling
ii) Interactive, Hash and Real time task
iii) CPU bound and I/O bound task.

b) Describe the scheduling algorithm implemented under Linux for task scheduling giving various data structure involved. **7**

5. a) What is meant by preemption disabling ? Give & explain kernel preemption related function. **6**

b) Enumerate and describe five causes of concurrency. How can a designer identify if race condition may occur and the kernel code needs to be synchronized ? **7**

OR

6. a) What is meant by the spinlocks ? Describe the use of spinlocks in interrupt handlers. Indicate at least four methods related with spinlocks. 7

b) Difference between : 6
i) Reader lock & writer locks.
ii) Binary & general semaphores.
iii) Semaphores & completion variable.

7. a) Explain struct page structure giving the meaning of each field. 7

b) Differentiate between : 6
i) Paging and segmentation ii) Pages and zones
iii) Page fragment and page fault.

OR

8. a) Define three types of zones used by Linux kernel. How is 'ezone' represented. 7

b) Difference between : 6
i) RTC & System timer ii) Jiffies and tick rate

9. a) What is super block object ? How is it related with the dentry object and file object ? Explain. 7

b) Describe various data structures associated with the process. 7

OR

10. a) What is the purpose of block I/O layer ? How is it different from character I/O layer ? With the help of neat diagram describe block I/O layer in Linux. 7

b) With reference to virtual file system under Linux describe each of following : 7
i) Dentry object ii) Super block object
iii) File object

11. a) What is meant by portability of an operating system ? Describe the features of Linux to support portability. 7

b) What is the purpose of radix tree ? Explain its role in page cache. 6

OR

12. a) Describe main memory organization as seen by Linux bringing out the meaning of various memory areas. 7

b) Enumerate various kernel modules under Linux and describe the purpose of each module. 6

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