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Question Paper Code : 80292

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Electronics and Instrumentation Engineering

CS 6401 – OPERATING SYSTEMS

(Common to Instrumentation and Control Engineering and Fourth Semester Computer Science Engineering and Information Technology and Sixth Semester Electronics and Communication Engineering and Medical Electronics)

(Regulation 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How does an interrupt differ from a trap?

2. What are the disadvantages of multiprocessor systems?

3. Distinguish between CPU-bounded and I/O bounded processes.

4. What resources are required to create threads?

5. Why are page sizes always powers of 2?

6. What is the purpose of paging the page tables?

7. Define C-SCAN scheduling.

8. Why is it important to scale up system-bus and device speeds as CPU speed increases?

9. What is virtualization?

10. What scheduling algorithm is used in linux operating system to schedule jobs?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe a mechanism for enforcing memory protection in order to prevent a program from modifying the memory associated with other programs. (8)

    (ii) What are the advantages and disadvantages of using the same system call interface for manipulating both files and devices? (8)

Or

    (b) (i) State and explain the major activities of an operating system with regard to file management? (8)

    (ii) Discuss the different multiprocessor organizations with block diagrams. (8)

12. (a) (i) Give an example of a situation in which ordinary pipes are more suitable than named pipes and an example of a situation in which named pipes are more suitable than ordinary pipes. (8)

    (ii) Describe the differences among short-term, medium-term, and long term scheduling. (8)

Or

    (b) (i) Explain why interrupts are not appropriate for implementing synchronization primitives in multiprocessor systems. (8)

    (ii) What are the different thread libraries used? Explain any one with example. (8)

13. (a) (i) What is the copy-on-write feature, and under what circumstances is its use beneficial? What hardware support is required to implement this feature? (8)

    (ii) Consider a system that allocates pages of different sizes to its processes. What are the advantages of such a paging scheme? What modifications to the virtual memory system provide this functionality? (8)

Or

    (b) (i) Explain the difference between internal and external fragmentation. (8)

    (ii) Discuss situations in which the most frequently used (MFU) page replacement algorithm generates fewer page faults than the least recently used (LRU) page-replacement algorithm. Also discuss under what circumstances the opposite holds. (8)

14. (a) (i) Describe some advantages and disadvantages of using SSDs as a caching tier and as a disk-drive replacement compared with using only magnetic disks? (8)

   (ii) Discuss how performance optimizations for file systems might result in difficulties in maintaining the consistency of the systems in the event of computer crashes. (8)

Or

   (b) (i) Distinguish between a STREAMS driver and a STREAMS module. (8)

   (ii) Could a RAID level 1 organization achieve better performance for read requests than a RAID level 0 organization? If so, how? Explain. (8)

15. (a) (i) Discuss three advantages of dynamic (shared) linkage of libraries compared with static linkage. Describe two cases in which static linkage is preferable. (8)

   (ii) How does Linux's Completely Fair Scheduler (CFS) provide improved fairness over a traditional UNIX process scheduler? When is the fairness guaranteed? (8)

Or

   (b) Explain the step-by-step procedure for setting up a local network services.

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