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Question Paper Code : 70383

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fourth / Fifth / Sixth Semester

Electronics and Instrumentation Engineering

CS 6401 – OPERATING SYSTEMS

(Common to Computer Science and Engineering/ Information Technology, Instrumentation and Control Engineering / Electronics and Communication Engineering, Medical Electronics)

(Regulations 2013)

(Also common to : PTCS 6401 — Operating Systems for B.E. (Part-Time) – Computer Science and Engineering – Third Semester (Regulations 2014))

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of peer-to-peer systems over client-server systems?
2. What is the purpose of system programs?
3. "Priority inversion is a condition that occurs in real time systems where a low priority process is starved because higher priority processes have gained hold of the CPU" – Comment on this statement.
4. Differentiate single threaded and multi-threaded processes.
5. In memory management consider the program named as Stackl which size is 100 KB. This program is loaded in the main memory from 2100 to 2200 KB. Show the contents of the page map table for the given scenario.
6. Define demand paging in memory management. What are the steps required to handle a page fault in demand paging?
7. Define C-SCAN scheduling.
8. Why is it important to scale up system-bus and device speeds as CPU speed increases?
9. Do FAT file system is advantageous? Why?
10. What is the responsibility of kernel in LINUX Operating system?

PART B — (5 × 13 = 65 marks)

11. (a) (i) With neat sketch discuss computer system overview. (7)

(ii) Enumerate the different operating system structures and explain with neat sketch. (6)

Or

(b) (i) State the basic functions of OS and DMA. (7)

(ii) Explain system calls system programs and OS generation. (6)

12. (a) (i) Explain the FCFS, preemptive and non preemptive versions of Shortest-Job-First and Round Robin (time slice = 2) scheduling algorithms with Gantt Chart for the four processes given. Compare their average turn around and waiting time. (10)

Process	Arrival Time	Burst Time
P1	0	10
P2	1	6
P3	2	12
P4	3	15

(ii) Discuss how deadlocks could be detected in detail. (3)

Or

(b) (i) Show how wait( ) and signal( ) semaphore operations could be implemented in multiprocessor environments, using the Test and Set( ) instruction. The solution should exhibit minimal busy waiting. Develop Pseudocode for implementing the operations. (8)

(ii) Discuss about the issues to be considered with multithreaded urograms. (5)

13. (a) Discuss the given Memory Management techniques with diagrams

(i) Partition Allocation Methods. (7)

(ii) Paging and Translation Look-aside Buffer. (6)

Or

(b) (i) Describe about free space management on I/O buffering and blocking. (7)

(ii) Discuss the concept of buddy system allocation with neat sketch. (6)

14. (a) (i) Why is it important to balance file-system I/O among the disks and controllers on a system in a multitasking environment? (7)

(ii) Discuss the advantages and disadvantages of supporting links to files that cross mount points. (6)

Or

(b) (i) Explain why logging metadata updates ensures recovery of a file system after a file-system crash. (7)

(ii) Could a RAID level 1 organization achieve better performance for read requests than a RAID level 0 organization? If so, how? (6)

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. (7)

(ii) How does Linux's Completely Fair Scheduler (CFS) provide improved fairness over a traditional UNIX process scheduler? When is the fairness guaranteed? (6)

Or

(b) Explain the step-by-step procedure for setting up a local network services. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Which of the following scheduling algorithms could result in starvation?

(i) First-come, first-served (5)

(ii) Shortest job first (5)

(iii) Round robin. (5)

Detail with Justification.

Or

(b) Outline a solution using semaphores to solve dinning philosopher problem. (15)

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