

Your name:

CSE 30341 Operating Systems: Module 4 Exam
OPEN BOOK, OPEN NOTES, CLOSED ELECTRONIC SEARCHES
INDIVIDUAL EFFORT

DURATION: 30 MINUTES

All questions carry equal weight. If you answer the question correctly, then you get 1 points. If you get it wrong, then you get -1 points. If you don't attempt a particular question, then you get 0 points for that question. The maximum and minimum scores for this exam are 0 and 6, respectively (which is gotten by taking your $(\text{score}+6)/2$).

Ockham's Razor principles (or Keep It Simple, Stupid: KISS principles) hold. ***Make no more assumptions than is needed***; you only have 5 minutes per question. You may write your justification for your answer in the space below. I may look at the argument to give partial credit. You can also use these argument to convince me in person that your answer was correct (using only the assumptions and arguments written by you in the answer). Football penalty rules do not apply to his exam, there will be no penalty for you in trying to convince me

- 1) The peak read bandwidth of a RAID-4 array grows linearly with the number of disks, but the single parity disk limits the peak write bandwidth
- 2) Doubling the rotation speed of a 10K RPM disk doubles its peak transfer bandwidth, but improves its throughput for random 8KB reads only marginally
- 3) Given a sufficiently fast CPU and appropriate block allocation policies, delayed write mechanisms can enable sequential disk writes at the storage system's peak transfer bandwidth, independent of the write size, but at the cost of reducing file system reliability in the presence of failures
- 4) For a RAID system with 8 disks, creating a RAID-0 partition of four 2-disk RAID-1 partitions has the same fault tolerance characteristics as creating a RAID-1 partition of two 4-disk RAID-0 partitions
- 5) To preserve data integrity, file system software must control the order in which disk writes complete.
- 6) Flash memory is a persistent storage technology that can store data at random locations without any seek or rotational latency. However, reading data from the flash memory still takes a small amount of time. In a Linux machine that uses a UNIX file system (inodes etc.) and flash memory, using a regular file for swapping is preferable to using a separate swap partition (from a performance standpoint).