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Quiz #3 Solutions

COMP 3000B: Operating Systems

March 13, 2007

1. C is a good language for implementing low-level operating system code because:
 - (a) It allows CPU registers to be directly manipulated.
 - (b) It has good built-in support for concurrency.
 - (c) **It allows memory allocation to be manually controlled through pointers and typecasts.**
 - (d) All of the above.
2. An inode contains all of the following **except**:
 - (a) user ID
 - (b) time of last data modification
 - (c) **filename**
 - (d) link count
3. When a process is waiting for an I/O operation to complete, it is said to be:
 - (a) **blocked**
 - (b) undead
 - (c) swapped
 - (d) sleeping
4. Page table entries (PTEs) typically contain
 - (a) **Physical frame numbers**
 - (b) Page offsets
 - (c) Last page access time
 - (d) All of the above
5. The “dirty” bit in a page table entry indicates that:
 - (a) A security violation has occurred
 - (b) The corresponding page has been accessed.
 - (c) **The corresponding page has been modified.**
 - (d) The corresponding page is shared between multiple processes.
6. If you cannot create a file on UNIX, which of these **cannot** be the cause of the problem?
 - (a) You don't have write access to the directory.
 - (b) **Fragmentation (there is no block large enough to hold the file)**
 - (c) There's not enough free space.
 - (d) There are no free inodes.
7. The UNIX filesystem organizes data blocks into:
 - (a) hash tables
 - (b) **wide, shallow trees**
 - (c) narrow, deep trees
 - (d) linked lists
8. The WSClock algorithm attempts to estimate the working set size of a program. For a program to avoid thrashing, it must have a working set that:
 - (a) **is smaller than physical memory**
 - (b) is smaller than virtual memory
 - (c) is smaller than the free space in the filesystem
 - (d) requires less CPU time than the maximum currently available