

COMP 3000: Operating Systems: Fall 2011 Test 2 Solutions

November 9, 2011

Possible answers: /home, /lost+found, /tmp, /usr, block devices, character devices, child PID, device drivers, device file, empty directories, filesystem image, filesystems, fork(), fsck, full directories, interrupts, kernel, libc, loopback mount, main(), mkfs, nothing, pthread_create(), pthread_join(), pthread_mutex_lock(), scheduler, signals, sparse file

1. Can a process modify its environment variables? **yes**
2. After a fork system call, the child process runs and then the parent process runs. **false**
3. Signal handlers can be called at almost any point in a process's execution. **true**
4. A semaphore or mutex can be implemented using standard C code. **false**
5. System V init scripts run programs **sequentially** or in parallel? (circle one)
6. Round-robin scheduling assigns CPU time inversely proportional to the number of processes that are running. **true**
7. Without errors, what does the execve system call return? **Ans : nothing**
8. Who calls a signal handler? **Ans : kernel**
9. This program is used to check the consistency of the data structures of a filesystem. **Ans : fsck**
10. This part of the kernel runs after a system call has been handled. **Ans : scheduler**
11. What call is used to create a new thread? **Ans : pthread_create**
12. What allocates the storage for environment variables and command-line arguments? **Ans : kernel**
13. A file that has a logical size of one gigabyte but only takes up 100K on disk is a **Ans : Sparse file**
14. When fsck finds an allocated inode for which there is no directory entry, it creates a directory entry for it in **Ans : /lost+found**
15. *Preferred answer:* **Filesystems** stored in **block devices** are normally mounted on **empty directories**.
Also accepted: **Filesystems** stored in **filesystem images** are normally mounted on **loopback devices**.
16. *Preferred answer:* **Device drivers** run inside the **kernel** in response to **interrupts**.
Also accepted: **Scheduler** run(s) inside the **kernel** in response to **fork()**.