CS347 QUIZ 1 July 21, 2016

1. Which of the following statements best describes the difference between a trap and an interrupt?

A. An interrupt occurs due to errors in the execution of the current process, while a trap occurs due to external events.
B. A trap occurs due to errors in the execution of the current process, while an interrupt occurs due to external events.
C. An interrupt is raised by block devices such as disk while a trap is caused due to I/O devices like keyboards.
D. An interrupt occurs due to system calls, while a trap occurs due to external events.

2. Considering the fact that the Linux kernel can load and remove kernel modules at runtime, is it an example of a monolithic kernel or a microkernel?

3. (True/False) Consider an application running a CPU-bound workload on a 4-core machine. The application has 4 threads. Each thread may make several blocking system calls during the execution of the application code. You may ignore any other processes running on the system. Increasing the number of threads in the application is expected to increase the application throughput.

4. (True/False) A CPU can sometimes execute kernel code in the user mode of a process.

5. When a trap occurs during the execution of a process, where is the context of the process saved?

A. Heap
B. User stack
C. Kernel stack
D. Program executable

6. (True/False) A process in user mode cannot execute certain privileged hardware instructions.

7. A process makes a system call to read a packet from the network device, and blocks. The scheduler then context-switches this process out. Is this an example of a voluntary context switch or an involuntary context switch?

8. (True/False) A context switch can occur only after processing a timer interrupt, but not after any other system call / trap / interrupt.

9. (True/False) A C program cannot directly invoke the OS system calls and must always use the C library for this purpose.

10. (True/False) A process undergoes a context switch every time it enters kernel mode from user mode.

11. (True/False) The memory addresses generated by the CPU when executing instructions of a process are called logical addresses.

12. (True/False) When a C++ executable is run on a Linux machine, the kernel code is part of the executable generated during the compilation process.

13. (True/False) When a C++ executable is run on a Linux machine, the kernel code is part of the virtual address space of the running process.

14. When a process makes a system call to transmit a TCP packet over the network, which of the following steps do NOT occur always?

A. The process moves to kernel mode.
B. The program counter of the CPU shifts to the kernel part of the address space.
C. The process is context-switched out and a separate kernel process starts execution.
D. The OS code that deals with handling TCP/IP packets is invoked.

15. What is the standard name given to the first process that starts on an OS after booting?