Kernel-Level Threads and POSIX Thread Management in Linux Quiz

1. What is a primary characteristic of kernel threads in Linux?

- ☐ A) Managed by the user application
- ☐ B) Fully managed by the OS kernel
- ☐ C) Only used for I/O operations
- ☐ D) Only run on single-core processors

2. In Linux, what system call is used to create threads and specify shared resources?

- ☐ A) `fork()`
- ☐ B) `pthread_create()`
- ☐ C) `clone()`
- ☐ D) `exec()`

3. What is the role of thread recycling in kernel threads?

- ☐ A) To switch between threads faster
- ☐ B) To reuse thread data structures after a thread is destroyed
- ☐ C) To avoid creating new kernel threads
- ☐ D) To manage thread priorities

4. Which of the following is a disadvantage of kernel threads in Linux?

- ☐ A) Slow page fault handling
- ☐ B) They are less portable than user threads
- ☐ C) They cannot run on multiple CPUs
- ☐ D) Kernel threads are always slower than user threads

5. What happens during a page fault in a multi-threaded process?

- ☐ A) The entire process is blocked.
- ☐ B) Only the thread causing the fault is blocked.
- ☐ C) The process terminates.
- ☐ D) All threads continue execution.

6. What is the purpose of `pthread_create()` in POSIX thread management?

- ☐ A) To terminate a thread
- ☐ B) To create a new thread
- ☐ C) To suspend a thread
- ☐ D) To cancel a thread

7. What is a detached thread in POSIX thread management?

- ☐ A) A thread that cannot be canceled
- ☐ B) A thread that automatically releases its resources after completion
- ☐ C) A thread that never finishes
- ☐ D) A thread that must be manually joined

8. Which function is used to terminate a thread in POSIX?

- ☐ A) `pthread_cancel()`
- ☐ B) `pthread_exit()`
- ☐ C) `pthread_join()`
- ☐ D) `pthread_cleanup_pop()`

9. Which system call is used to wait for a thread to complete before proceeding?

- ☐ A) `pthread_create()`
- ☐ B) `pthread_exit()`
- ☐ C) `pthread_join()`
- ☐ D) `pthread_cancel()`

10. What is the use of pthread_cleanup_push() in POSIX?

- ☐ A) To push a thread to the ready queue
- ☐ B) To register a cleanup handler for resource management
- ☐ C) To suspend a thread
- ☐ D) To cancel a thread's execution

11. What does `pthread_setcancelstate()` control?

- ☐ A) A thread's ability to join with others
- ☐ B) A thread's priority level
- ☐ C) Whether a thread can be cancelled or not
- ☐ D) How a thread handles page faults

12. Why is slow context switching a disadvantage of kernel threads?

- ☐ A) It uses more CPU cycles
- ☐ B) It leads to high memory usage
- ☐ C) It requires kernel intervention, which increases overhead
- ☐ D) It decreases the system's ability to use multiprocessing

13. Which POSIX function allows a thread to be cancelled by another thread?

- ☐ A) `pthread_create()`
- ☐ B) `pthread_join()`

☐ C) `pthread_cancel()`
☐ D) `pthread_exit()`

14. In Linux, how does multiprocessing benefit from kernel threads?

☐ A) Threads can run on different CPUs simultaneously
☐ B) Threads are created faster
☐ C) There are fewer context switches
☐ D) Kernel threads are more portable

Answers:

1. B
2. C
3. B
4. B
5. B
6. B
7. B
8. B
9. C
10. B
11. C
12. C
13. C
14. A