Multi-threading in Modern Systems Quiz

1. What is the main difference between a single-threaded and multi-threaded process?

- ☐ A) A single-threaded process can execute multiple tasks simultaneously.
- ☐ B) A single-threaded process has one control flow, while a multi-threaded process has multiple control flows.
- ☐ C) A multi-threaded process requires more memory than a single-threaded process.
- ☐ D) A single-threaded process is faster than a multi-threaded process.

2. What component is responsible for keeping track of a thread's current instruction during execution?

- ☐ A) File handler
- ☐ B) Ordinal counter
- ☐ C) Execution stack
- ☐ D) Device handler

3. What are the components that threads within a process share?

- ☐ A) Local variables and registers
- ☐ B) Execution stack and ordinal counter
- ☐ C) Memory space and file handlers
- ☐ D) Registers and device handlers

4. In modern systems, how is a thread commonly defined?

- ☐ A) A complete process with its own memory space
- ☐ B) A lightweight process that operates within the context of a parent process
- ☐ C) A standalone entity independent of processes
- ☐ D) A special kind of process used only for I/O operations

5. Which of the following best describes the shared memory concept in multi-threading?

- ☐ A) Threads have separate memory spaces but share data through the file system.
- ☐ B) Threads from the same process share the same memory space, allowing resource sharing.
- ☐ C) Each thread has its own independent memory and data segments.
- ☐ D) Threads only share memory during synchronization.

6. How does multi-threading enhance a system's responsiveness?

- ☐ A) It allows blocked threads to continue execution.

☐ B) It prevents I/O operations from blocking the entire process, allowing other threads to continue running.
☐ C) It minimizes the need for file handlers.
☐ D) It runs only one thread at a time to avoid memory contention.

7. What is the main thread in a process?

☐ A) The only thread that can access the process's memory.
☐ B) The primary thread that handles the main execution flow of the process.
☐ C) A thread dedicated to handling file I/O operations.
☐ D) A thread that can create new processes within the parent process.

8. Which of the following is an advantage of threads over processes?

☐ A) Threads have their own memory space, reducing memory conflicts.
☐ B) Thread creation is faster and more efficient compared to process creation.
☐ C) Threads have better isolation from each other than processes.
☐ D) Threads can operate independently without any shared resources.

9. How does resource sharing among threads improve performance in multi-threaded systems?

☐ A) It reduces the need for communication between processes.
☐ B) It allows threads to share data without the overhead of copying.
☐ C) It eliminates the need for synchronization mechanisms.
☐ D) It prevents memory leaks by isolating memory spaces.

10. Why is thread creation faster than process creation in most operating systems?

☐ A) Threads require more system resources, making them easier to create.
☐ B) Threads share resources like memory and file handlers, whereas processes require independent resources.
☐ C) Threads have more sophisticated error-handling mechanisms.
☐ D) Threads operate independently of the operating system, while processes need OS management.

11. Which system resource is not typically shared by threads within a process?

☐ A) Memory space
☐ B) Ordinal counter
☐ C) File handlers
☐ D) Registers

12. What is the potential drawback of threads sharing the same memory space?

- ☐ A) It limits the number of threads that can be created.
- ☐ B) It increases the likelihood of resource contention and data corruption.
- ☐ C) It reduces the performance of the system.
- ☐ D) It makes thread communication slower and more complex.

13. What are local variables in the context of multi-threading?

- ☐ A) Variables that are shared across all threads in a process.
- ☐ B) Variables that are specific to each thread and stored in the thread's execution stack.
- ☐ C) Global variables accessible by any thread in the system.
- ☐ D) Variables that store the thread's ordinal counter.

14. How does multi-threading contribute to memory efficiency in a system?

- ☐ A) It allows multiple processes to share the same memory space.
- ☐ B) Threads use shared memory, reducing the need for allocating separate memory for each process.
- ☐ C) Threads prevent memory fragmentation.
- ☐ D) Each thread manages its own memory, leading to more efficient memory usage.

15. Which of the following is not an advantage of multi-threading?

- ☐ A) Reduced memory usage due to shared memory.
- ☐ B) Improved responsiveness and system performance.
- ☐ C) Simplified debugging process compared to single-threaded systems.
- ☐ D) Faster creation time compared to process creation.

Answers:

1. B
2. B
3. C
4. B
5. B

6. B
7. B
8. B
9. B
10. B
11. D
12. B
13. B
14. B
15. C