Parallel Programming Quiz

Question 1: What is Parallel Programming?

A) A technique where multiple tasks or computations are executed sequentially to improve performance.

B) A technique where multiple tasks or computations are executed simultaneously to improve performance

C) A technique used only for single-threaded applications.

D) A method to decrease the computational time for I/O-bound tasks.

Correct Answer: B

Question 2: Which of the following is NOT a type of parallelism?

A) Task Parallelism

B) Data Parallelism

C) Time Parallelism

D) Both A and B

Correct Answer: C

Question 3: What is the impact of the Global Interpreter Lock (GIL) on Python threading?

A) GIL allows multiple threads to execute Python bytecodes in parallel for CPU-bound tasks.

B) GIL prevents true parallel execution of threads for CPU-bound tasks, but does not affect I/O-bound task

C) GIL increases the performance of multi-threaded applications for both I/O-bound and CPU-bound tasks.

D) GIL has no effect on Python's performance.

Correct Answer: B

Question 4: Which type of task can benefit from Python threading due to the GIL?

A) CPU-bound tasks

B) I/O-bound tasks

C) Both A and B

D) None of the above

Correct Answer: B

Question 5: What is the key difference between threading and multiprocessing in Python?

A) Threading utilizes multiple CPU cores, while multiprocessing runs on a single core.

B) Threading bypasses the GIL, while multiprocessing is limited by the GIL.

C) Multiprocessing bypasses the GIL and utilizes multiple CPU cores for true parallel execution.

D) Multiprocessing is only for I/O-bound tasks.

Correct Answer: C

Question 6: Which of the following best describes the effect of the GIL on multi-threading for CPU-bound ta

A) Threads can run truly in parallel, improving performance for CPU-bound tasks.

B) The GIL prevents true parallel execution of threads, reducing the performance for CPU-bound tasks.

C) The GIL has no effect on performance for CPU-bound tasks.

D) The GIL increases the performance of CPU-bound tasks by making threads synchronize automatically.

Correct Answer: B

Question 7: Which of the following Python libraries is ideal for parallel execution of CPU-bound tasks?

A) threading

B) multiprocessing

C) time

D) json

Correct Answer: B

Question 8: Which of the following statements is true about sequential execution?

A) It utilizes multiple CPU cores for improved performance.

B) It is simple but not efficient for computationally intensive tasks.

C) It is ideal for tasks with large datasets.

D) It can achieve parallel execution without additional libraries.

Correct Answer: B

Question 9: What happens when multiple threads modify a shared resource (e.g., a counter) in a multi-thre

A) The counter will always be updated correctly to the expected result.

B) The counter may not be updated correctly due to the GIL.

C) The GIL ensures that the counter is updated in parallel.

D) The threads will be locked, and no updates will occur.

Correct Answer: B

Question 10: Why is multiprocessing recommended for CPU-bound tasks in Python?

A) It uses multiple threads to execute tasks in parallel.

B) It bypasses the GIL, enabling true parallel execution across multiple CPU cores.

C) It is faster than threading for I/O-bound tasks.

D) It helps optimize memory usage by reducing the number of processes.

Correct Answer: B