Analysis-2

Execution times for Question 4 Using Multithreading, Multiprocessing, and MPIs :

Q4	Execution Time with given arguments
T1 (Multithreading)	10 threads : 27.22 second(s)
T2 (Multiprocessing)	4 processes : 19.93 second(s)
T3 (Using MPIs)	4 workers : 17.896664142608643

Here, Multithreading has taken more time than other two, multiprocessing and MPIs.

→ Python Multithreading is slow because every thread is processing one by one not parallelly So, it will take time to execute while Multiprocessing and MPI is taking 4 cores to execute the task and run it parallelly which takes less time as compared to Multithreading.

→ Hence, in multiprocessing, it will divide work in 4 cores, so, each core has to do only 25%, while in multithreading it will take 100% to do task.