Mid term A
Q1) [CLO-1] [5 Marks]
Explain Flynn's classification in computer architecture and demonstrate its types with examples?

Q2) [CLO-1] [5 Marks]
How does Amdahl's Law generalize and apply to a scenario where 70% of the workload can benefit from optimization while the remaining 30% remains unaffected? If we optimize the beneficial portion to be 4 times faster, how does Amdahl's Law help us **demonstrate** and understand the overall speedup achieved, taking into account the optimized fraction?

Q3) [CLO-2] [5 Marks]
Can you define a race condition in concurrent programming and differentiate the conditions crucial for preventing it? **Compare** various strategies used to mitigate race conditions and evaluate their effectiveness with examples.

Q4) [CLO-2] [5 Marks]
Can you elaborate on conflicts of serializabity of transactions, comparing them to other types of transaction conflicts? **Differentiate** the types of conflicts of serializabity arise and how they differ from conflicts like deadlocks or livelocks. Additionally, evaluate the impact of conflicts of serializabity on database performance and integrity.

Mid term B
Q1) [CLO-1] [5 Marks]
Can you **define** parallel and distributed computing and demonstrate their applications by highlighting at least five different aspects where they are utilized? Additionally, estimate how these computing paradigms contribute to improving computational efficiency and scalability in various domains?

Q2) [CLO-2] [5 Marks]
Explain Peterson's Solution algorithm, its approach in ensuring mutual exclusion and compare its effectiveness in preventing race conditions with other methods. Lastly, **evaluate** the advantages of Peterson's Solution in solving the requirements of the critical section problem.

Q3) [CLO-1] [5 Marks]
Define mutex and semaphore in the context of concurrent programming and **demonstrate** their algorithm? Additionally, could you explain their types and how they are applied to synchronize access to shared resources? Lastly, estimate the effectiveness of mutex and semaphore in ensuring thread safety and preventing race conditions in concurrent systems.

Q4) [CLO-2] [5 Marks]
Can you **elaborate** on conflicts of serializability of transactions, comparing them to other types of transaction conflicts? Differentiate the types of conflicts of serializability arise and how they differ from conflicts like deadlocks or livelocks. Additionally, evaluate the impact of conflicts of serializability on database performance and integrity.