

CPS Exam

Answer 3/4 questions

- 1 - Analysis & Design
- 2 - Multi-threading
- 3 - Distributed Parallelism
- 4 - GPU

3&4 generally avoided

Analysis & Design

Metrics - efficiency / speedup

Flynn's Taxonomy

SISD | MISD

SIMD | MIMD

Amdell's Law

[Lectures 1 and 2]

Speedup = SeqTime / ParTime

Efficiency = Speedup / cores

Pipeline

Thread Pool

Multi-threading

Threads

Locks - mutexes etc

Futures

~Atomics

Race Conditions —> Non-determinism —> Locking —> Deadlock |

Livelock

OpenMP

Scheduling - pre-emptive / cooperative

Distributed Parallelism

Message Passing Interface (MPI)

Message passing

{Bandwidth & Latency}

I/O bound / CPU bound

GPU

Probably gonna ask to write an algorithm - monte carlo pi, matrix/vector

addition

How GPU works

Problems on GPU