

King Saud University
College of Computer and Information Sciences
Department of Computer Science
CSC453 – Parallel Processing – Tutorial No 1 – Fall 2023

Question 1

1. Give the definition of Parallel computing and Parallel Programming
2. Enumerate and give a brief description of the main opportunities of parallelism.
3. Enumerate and give a brief description of the main aspects of parallel computing.
4. What are the main differences between Distributed and Parallel Computing.

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Question 1

1. Give the definition of Parallel computing and Parallel Programming

Parallel computing:

form of computation can be done in same time simultaneously

Parallel programming:

decomposing program into tasks and employ this tasks into parallel processors

2. Enumerate and give a brief description of the main opportunities of parallelism.

1- Instruction level parallelism:

hidden parallelism in computer program done by compilers, by transform every instruction into binary tree and every instruction in the same level in the tree are done simultaneously

2- Single computer level

a- multi core computers
the chip have multi core processor

b- multi processors (SMP)
symmetric multi processor

3 - multiple computers level

- servers
- clusters: done in compile time
- grids: multi computers maybe done in compile time or not

3. Enumerate and give a brief description of the main aspects of parallel computing.

- computer architecture
working in hardware
- algorithms and applications
reasoning about performance
designing parallel algorithms
- parallel programming
working in:
 - programming models
 - programming languages
 - framework

4. What are the main differences between Distributed and Parallel Computing.

	Distributed computing	Parallel computing
objective	↗ availability ↗ reliability	↘ latency (speed up) ↗ throughput ↗ bandwidth
assumptions	unreliable	Reliable
work load	Coarse grained	Fine grained
Interaction	infrequent (دليل)	Frequent (مكثف)