1. Define the following: Task, Pipelining, Shared Memory, Communications, Synchronization.

* Task:
* Pipelining:
* Shared Memory:
* Communications:
* Synchronization:

1. Classify parallel computers based on Flynn's taxonomy. Briefly describe every one of them

* Single Instruction, Single Data (SISD): A serial computer which only has single instruction stream and single data stream during any one clock cycle.
* Single Instruction, Multiple Data (SIMD): one of parallel computer which execute the same instruction at any given clock cycle and processing unit is capable of operating on a different data element.
* Multiple Instruction, Single Data (MISD): Each processing unit operates on the data independently via separate instruction streams, a single data stream is fed into multiple processing units.
* Multiple Instruction, Multiple Data: Every processor may be executing a different instruction stream, every processor may be working with a different data stream

1. What are the Parallel Programming Models?

Ans: Shared memory (without threads), threads, distributed memory/ message passing,

data parallel, hybrid, Single Program Multiple Data (SPMD), Multiple Program

Multiple Data (MPMD)

1. List and briefly describe the types of Parallel Computer Memory Architectures. What type is used by OpenMP and why?

* Uniform Memory Access (UMA): Identical processors with equal access and access times to memory. All the processors are aware of any updates made to any one processor.
* Non-Uniform Memory Access (NUMA): One Symmetric Multiprocessor (SMP) can directly access memory of another SMP and not all processors have equal access time to all memories.

1. Compare Shared Memory Model with Threads Model?

Ans: In shared memory, processes and tasks have an equal access to the memory for

reading and writing. In a thread model a single process can have multiple threads

running at the same time.

1. What is Parallel Programming?

Ans: Parallel programming increase the available computation power for faster application processing or task resolution. It is the execution of multiple processes or threads simultaneously through either a single or multiple processor.

1. What is system on chip(SoC)? Does Raspberry PI use system on SoC

* A system on chip(SoC) is a microchip which is capable to handle all the tasks run on a CPU without any other external chips supporting it. It contains GPU, memory, USB controller, power management circuits, and wireless radios.
* Raspberry PI uses system on chip (SoC)

1. Explain what the advantages are of having a System on a Chip rather than separate CPU, GPU and RAM components.

* The size of CPU is a bit smaller than SOC but SOC accommodates all the required components without any additional chips.
* Due to its very high level of integration and much shorter wiring, an SoC also uses considerably less power.
* In today’s world and in future we expect electronics to be sleeker, lightweight, small, and with long lasting battery power. SoCs takes less space while providing good computing power and provides more space for batteries.
* In today’s market we have many manufactures making phones, tablets and other electronics with pricing ranging from really cheap to expensive. SoCs requires only one chip which costs less than manufacturing multiple chips this makes product manufacture cheap in return making products cheaper.