1) Identify the components on the raspberry PI B+

**CPU in the center, USB ports on the right side, ethernet port below USB ports, power port to the left of the ethernet port, HDMI port to the left of the power port. Slot for the card is on the left side.**

2) How many cores does the Raspberry Pi’s B+ CPU have?

**4 cores.**

3) List three main differences between X86 (CISC) and ARM Raspberry PI (RISC).

**ARM has much fewer available instructions, ARM has more general purpose registers, ARM instructions only operate on registers.**

4) What is the difference between sequential and parallel computation and identify the practical significance of each?

**Sequential computation executes step by step, whereas parallel computation can execute simultaneously.**

5) Identify the basic form of data and task parallelism in computational problems.

**Data parallelism is the simultaneous processing of multiple pieces of data at once, all undergoing the same computation. Whereas task parallelism is where multiple different tasks as part of a larger program can be executed simultaneously.**

6) Explain the differences between processes and threads.

**Threads are more lightweight for smaller tasks, while processes are larger abstractions of the overall program as it is running. The process can be broken up into threads, which belong to the process and share a common memory. The threads decompose the larger tasks to execute in parallel.**

7) What is OpenMP and what is OpenMP pragmas?

**OpenMP is a set of rules and standards that programs which use OpenMP pragmas have to follow. OpenMP pragmas are instructions that allow a program to operate on multiple threads.**

8) What applications benefit from multicore (list four)?

**Web servers, Compilers, Database servers, and Multimedia applications**

9) Why Multicore? (why not single core, list four)

* **Many applications are multithreaded so you need multiple cores to run**
* **Can execute more processes in shorter time**
* **You can execute multiple tasks at the same time as a user**
* **Trend towards multithreading necessitates multicore use**