**CSCI 6303**

**Homework Assignment #4**

**Dr. Abraham**

* 1. One of the Intel Pentium I7 processors having 4 cores, 8 threads and 8 MB cache claims a speed of 2.9 GHz. Please explain each of these terms including GHz. How do the speed relate to a clock cycle.
	2. Amdahl’s law. We are considering an enhancement to the processor of a web server. The new CPU is 20 times faster on search queries than the old processor. The old processor is busy with search queries 70% of the time, what is the speedup gained by integrating the enhanced CPU?
	3. Explain the principles behind using Cache memory. What are the three ways of mapping cache? Total memory address is divided into three fields that helps locate the data in the cache. What are these fields? Consider a machine with a byte **addressable main memory of 256 bytes** and block size of 8 bytes. Assume that a direct mapped cache consisting of 32 lines is used with this machine. How is a 16-bit memory address divided into tag, line number, and byte number?
	4. Explain replacement and write back policies as related to cache.
	5. Explain RAID Levels. Explain power supply used in desktop computers.
	6. What are the factors that influence performance of a CPU?