CSSE 132 – Introduction to Systems Programming
Rose-Hulman Institute of Technology

Quiz 9 Memory Hierarchy

Name (Print):_____ RHIT Username:_____

1. Fill out the table to explain tradeoffs of different memory/storage solutions.

Type	Technology	Speed	Cost	Other
Static RAM				
Dynamic RAM				
Solid State Drive				
Hard Disk				

2. What parts of memory in a computer use static RAM (SRAM)?

3. What parts of memory in a computer use dynamic RAM (DRAM)?

4. What makes DRAM *dynamic*? (i.e., what property distinguishes it from static RAM?)

5. Can I use DRAM as my storage to replace SSD?

6. What are some advantages and disadvantages of using a solid-state drive (SDD) versus a hard disk drive?

7. You have a hard drive that has a cache for the data on the disk. The cache takes 500 ns to access. The drive puts often accessed data in the cache and 99.129% of time, the desired data is ready in the cache. If the data is not found in the cache, it must be read off the disk, taking 10 ms to access.

   If you always check the cache before attempting to load the data from disk, what is the new average access time for data using this hard drive?

8. **Reflection:** What is one thing from this topic that you found interesting, OR what is one question you are now curious to learn more about?