CS 3101 Computer Organization

Homework 7

**Due Date: Monday, December 3, 2018 at beginning of class**

Type your answers in a word processor, print and submit hardcopy in class. Do not handwrite.

***Show your steps to receive partial credit.***

1. Suppose the daytime processing load consists of 60% CPU activity and 40% disk activity. Your customers are complaining that the system is slow. After doing some research, you have learned that you can upgrade your disks for $8,000 to make them 2.5 times as fast as they are currently. You have also learned that you can upgrade your CPU to make it 1.5 times as fast as the current CPU for $5,000.

= 1.25 | = 1.31

5000/25 = $200 per % | 8000/31 = $258 per %

a. Which upgrade option would give a faster system?

The disk upgrade would ultimately give you the faster system.

b. Which upgrade option would give the best return of investment for each percent of speed improvement?

The CPU has the better ROI at $200 per % increase.

1. Suppose a disk drive has the following characteristics:

• 6 surfaces

• 1024 tracks per surface

• 256 sectors per track

• 512 bytes/sector

• Track-to-track seek time of 8 milliseconds

• Rotational speed of 5000 RPM.

a. What is the total capacity of the drive?

6\*1024\*256\*512 bytes = 768 MB.

b. What is its average access time?

(60/5000 x 1000)/2 = 6ms + 8ms = 14ms