**CIS 350 – INFRASTRUCTURE TECHNOLOGIES**

**HOMEWORK # 5**

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(You may do this homework in groups of 2 students maximum.)

**Topics**: Input/Output (Chapter 9), Computer Peripherals (Chapter 10), and Modern Computer Systems (Chapter 11)

Work the following Exercises. Attach additional pages for your answers. You answers to essay questions should be brief and capture the essence. Attempt to answer all questions as I will pick out at random only 3 questions (1 from each chapter) and grade your answers to these questions only. As a result, your overall grade for this homework will be based on the 3 graded questions only.

1. Ex. 9.4, p. 293
2. The disk controller interrupts the cpu.
3. Because we don’t know how long the data transfer would take. A program thread would have to sleep for the amount of time it would take for the disk to read the largest possible file on the disk.
4. The CPU stops the program, saves the program’s state (the important variables needed to continue operation at a later time), and calls the address in memory for the interrupt handler. The handler tells the program the disk transfer completed and then the program’s state is restored and begins executing again.
5. Ex. 9.6 and 9.7 on p. 293. These 2 questions are closely related. Answer them together.

An interrupt vector points to the memory location for the interrupt handler. Polling is a technique where a program asks the status of a device. Polling has a high overhead and must be done frequently to make sure the data isn’t lost. Interrupts are a much better alternative to polling.

1. Ex. 9.14, p. 293

The first interrupt suspends the current program and gives control to the program for that interrupt. When a second interrupt occurs, its priority is compared to that of the first interrupt, and if it is higher priority, it suspends the interrupt program for the first interrupt and executes the program for its interrupt, otherwise it occurs after the first interrupt finishes.

1. Ex. 10.2, p. 329 (under Exercises)

Flash memory has very fast read/write times. Hard disks have larger storage capacities. Hard disks and flash memory are both more reliable than RAM, RAM is volatile, which means that RAM disappears when the computer gets shutdown/reset. RAM is faster than both flash memory and hard disks.

1. Ex. 10.10, p. 330

640x480x3=900KB. 1600x900x3=4,320,000bytes. 1440x1080x3=4,665,600bytes. 2560x1440x3=11,059,200bytes.

((4.7\*1024^3)/(1920\*1080\*3)) 811 images will fit on a 4.7GB DVD-ROM

1. Ex. 10.14, p. 331

Assume the “wide screen” – see the textbook pp. 311.

9

14"

18.4"

y

x

16

The sides x and y could be calculated from simple proportions:

18.4/9=14/y → y=9\*14/18.4 and 18.4/16=14/x → x=16\*14/18.4

a. 131.4dpi

b. 0.19mm. 0.26mm display would not be sufficient.

c. 105.2dpi. 0 .24mm. a .26mm display would not be sufficient.

1. Ex. 11.2, p. 356 (under Exercises)

Different buses can be optimized for specific tasks.

1. Ex. 11.5, p. 357 (under Exercises)

1920x1080x3x60=373248000=356~MB. Only one PCI-Express Lane is needed to support the monitor at full capacity.

1. Ex. 11.18, p. 357

Both grid and cloud computing use computing power as a resource. Cloud computing can be used for any number of things, while grid computing is meant for applications with large overheads.