End of Ch # 10 Exercises

10.3 (A) –" A multiplattered hard disk is divided into 1100 sectors and 40,000 cylinders. There are six platter surfaces. Each block holds 512 bytes. The disk is rotating a rate of 4800 rpm. The disk has an average seek time of 12 msec. What is the total capacity of this disk?"

Answer: -Disk Capacity = No of Platters * No of Sectors * No of Cylinders * No of Bytes in each block

135,168,000,000 = 125.88 GB

10.4 (A)- "The average latency on a disk with 2200 sectors is found experimentally to be 110 msec. What is the rotating speed of the disk?

Average latency = (½)*(1/rotational speed

$$= 1/(2*110) = 0.0045$$

[I] For a display of 1920 pixels by 1080 pixels at 16 bits per pixel how much memory, in megabytes, is needed to store the image?

Total bytes = 1920 pixels* 1080 pixels* 16 bytes/pixels

$$= 33,177,600 \text{ bytes}$$

$$= 31.64 \text{ MB}$$

[II] What is the average rotational latency of a hard drive rotating at 7,200 RPM or 120 revolutions per second? (Give your answer in milliseconds)

Answers: -average latency time = (½)*(1/rotational speed)
Change rotational speed to revolution per sec: 7200 rev/min x [1 min / 60 sec] = 120 rev/sec
Average latency time = 1/(2*120) = 1/240 = 0.004167 ms = 4.167ms

[III] What is the transfer time for a hard drive rotating at 7,200 RPM or 120 revolutions per second? Assume there are 30 sectors per track. (Give your answer in milliseconds)

Answer: -   Transfer time = 1/(Number of sectors x rotational speed

Transfer time = 1/(30 sectors * 120 revolutions per second).000278 sec or .278 ms