**10.3 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 at a rate of 4800 rpm. The disk has an average seek time of**

**12 msec.**

1. **What is the total capacity of this disk?**

Answer: The capacity of the disk is 125 TB

**10.4 The average latency on a disk with 2200 sectors is found experimentally to be**

**110 msec.**

1. **What is the rotating speed of the disk?**

Answer:

No of Sectors: 2200

Average Latency = 110 msec

Average Latency = (1/2) x (1/ Rotational speed)

Rotational Speed= 1/2 average latency

Rotational Speed = 1/ (2\*110)

Rotational Speed = 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?**

Answer:

Total no of pixels = 1920\*1080 = 20,73,600 pixels

Total memory needed = 20,73,600 \* 2 bytes/pixel = 41,47,200 Bytes

1MB = 2^20 B = 10,48,576

Upon converting to Megabytes: 41,47,200 Bytes ( 1MB / 1048576 bytes) = 3.955 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)**

Answer:

Rotational Speed = 120 Rev / Sec

Average latency time = (1/2) \* (1 / Rotational Speed)

= (1/2) \* (1/120)

= 0.004167 sec = 4.167 ms

**[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:

Rotational Speed = 120 Rev / Sec

No of Sectors = 30 sector/track

Transfer Time = 1 / (No of Sector \* Rotational Speed)

= 1/ (30 \* 120)

= 0.000278 sec

= 0.278 ms