**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 at a rate of 4800 rpm. The disk has an average seek time of 12 msec. What is the total capacity of the disk?**

Ans: The capacity of the disk will be = number of sectors\*number of cylinders\* platter surfaces\*size of block

Capacity = 1100 \* 40000 \* 6 \* 512 = 135,168,000,000 bytes

**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?**

Ans: Number of Sectors = 2200

Average Latency = (1/2) \* (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?**

Ans: Total number of pixels = 1920 \* 1080 = 2,073,600

Total memory needed = 2,073,600 \* 2 bytes/pixels = 4,147,200

1 mb = 2^20 B = 1,048,576

Converting To MB = (1/ 1,048,576) = 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)**

Ans: Rotational Speed = 120 Rev/sec

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

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

= 0.004167 sec or 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)**

Ans: 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 or 0.278 ms