Akshatha Vasant Hegde
CWID: 20009287

END OF CHAPTER 10 EXERCISES

3A) 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 4800 rpm. The disk has an avg seek time of 12 msec. What is the total capacity of the disk.

Ans) No of sectors: 1100

No. of cylinders: 40,000

No of platter surfaces: 6

Size of block = 512 bytes.

Rotation speed · 4800.

Avg seek time = 12 msec

Total capacity = No of sectors × no: of cylinders × platter surfaces × size of block

$$= 1100 \times 40,000, \times 6 \times 512$$

$$= 135,168,000,000$$

4A) The average latency on a disk with 2200 sectors is found to be experimentally 110 msec. What is the rotating speed of the disk?

Ans) No of sectors = 2200

Rotational speed : ?

Average latency: 110 msec = 110×10^{-3} sec

Average latency $= \frac{1}{2} \times \frac{1}{\text{rotational speed}}$

$110 \times 10^{-3} s = \frac{1}{2} \times \frac{1}{\text{rotational speed}}$

$220 \times 10^{-3} s = \frac{1}{\text{rotational speed}}$

rotational speed $= 4.545$ sec

CHAPTER 10 Calculation exercises.

1) 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) Display size $= 1920$ pix $\times$ 1080 pix $= 2,073,600$ pixels.

Memory per pixel $= 16$ bits $= 2$ bytes

Memory $=$ Display size $\times$ memory per pixel

$= 2,073,600 \times 2$

$= 4,147,200$ bytes

$= 3.9551$ Megabytes.

11) What is the average rotational latency of a hard drive rotating at 7200 rpm or 120 revolutions per second? (Ans in millisecon)

Ans) Rotating Speed $= 120$ rps

Average latency $= \frac{1}{2} \times \frac{1}{\text{Rotating speed}}$

$= \frac{1}{2} \times \frac{1}{120}$

$$= \frac{1}{240}$$

$$= 0.004\overline{166} \text{ s}$$

Average latency $= 4.1\overline{66}$ milliseconds.

III) What is the transfer time for a hard drive rotating at 7200 rpm and 120 revolutions per second? Assume there are 30 sectors per track. (ans in milliseconds

Ans) transfer time $= \dfrac{1}{\text{numbers of sectors} \times \text{rotational speed}}$

$$= \frac{1}{30 \times 120 \text{ rps}}$$

$$= \frac{1}{3,600}$$

$$= 0.0002\overline{777} \text{ s}$$

$$= 0.2\overline{7} \text{ milliseconds.}$$