Problem 1

1. 4096/190 = 21 records
2. 1000000/21 = 47619.04

Ceil(47619.04) = 47620 blocks

One track has 50/(4096/1024) = 12 blocks,

One cylinder has 12\*4\*2=96 blocks.

We need 47620 blocks to store this file.

So we need 47620/96 = 497 cylinders,

1. Each block can store 4096/100 = 40 records,

Each track can store 12 blocks

1000\*4\*2\*12\*40 = 3840000 records

1. We need 100000/40 = 2500 blocks

2500 / 12 = 209 tracks

209/4/2 = 27 cylinders

Access time = seek time + Rotational Delay + Transfer Time

Sequential Access → We don't need rotational delay

A track can be read/written in one rotation → Transfer Time = no of tracks \* time of one rotation = 209 \* (1/7200\*60) = 1.74 s

Seek time is the time to locate the tracks → Seek time of the file = no Of Cylinders \* seek time of track = 27 \* (1/7200\*60) = 0.225s

Therefore, total access time is 1.74+ 0.225 = 1.97 seconds.

1. For any block,

access time = seek time + rotational delay + transfer time

Seek time = 7 msec

Rotational delay = (1/7200\*60) /2 = 4 msec

Transfer time = 4k/((1\*50/(1/7200\*60))K/sec) = 0.67 msec

The access time for a block of data is 11.67 msec

The file contains 2500 blocks, so the access time is

29.175 sec.

Problem 2