1. A hard disk with one platter rotates at 15,000 r/min and has 1024 tracks, each with 2048 sectors. The disk head starts at track 0 (track are numbered from 0 to 1023). The disk then receives a request to access a random sector on a random track. If the seek time of the disk head is 1 ms for every 100 tracks it must cross;

2 a) What is the average seek time?

Average seek time = (0 + 1 + 2 + … + 102) / 102 = 51.5 ms

2 b) What is the average rotational latency?

Average rotational latency = 1/2 \* 1/rotation speed = 1/2 \* 1/250r per second = 0.002 sec = 2ms

2 c) What is the transfer time for a sector?

Transfer time = 1 / number of sectors \* rotational speed = 1.95 μs

2 d) What is the total average time to resolve a request?

The total average time = average seek time + average rotation latency + transfer time = 53.5 ms