1. What is the fundamental factor limiting the data density of optical storage.

2. The Seagate Cheetah 10K.6 has a capacity of 146.8 GB with an Ultra 320 SCSI interface. Its spindle speed (rotations per minute) is 10K. Its average seek time is 4.7 msec for reads and 5.2 msec for writes. (The head needs to be better positioned for writes, therefore this dual seek time rate.) Assume that we have a workload of 60% reads and 40% writes, all to single sectors.
   a. What is the average time that a request takes?
   b. What is the maximum number of requests that the drive can handle per second?
3. The Western Digital Caviar IDE drive has a capacity of 250 GB and a rotational speed of 7200 rotations per minute. Its read seek time is 8.9 msec and its write seek time is 10.0 msec. Assume that you deploy 5 of these drives in a RAID Level 5 configuration. Assume that the RAID has to sustain a workload of 250 requests, out of which 50 are write requests. What is the average utilization of one of the five disks?