ICS 321 Data Storage & Retrieval — I

Adapted from Exercise 9.5 Ramakrishnan & Gehrke: Consider a disk with a sector size of 512 bytes, 2000 tracks per surface, 50 sectors per track, five double-sided platters, and an average seek time of 10 msec.

- 1. What is the capacity of a track in bytes? What is the capacity of each surface? What is the capacity of the disk?
- 2. How many cylinders does the disk have?
- 3. Give examples of valid block sizes. Is 256 bytes a valid block size? 2048? 51,200?
- 4. If the disk platters rotate at 5400 rpm (revolutions per minute), what is the maximum rotational delay?
- 5. If one track of data can be transferred per revolution, what is the transfer rate?
- 6. If block size is 3072 bytes, and a DBMS page is 3072 bytes, what is the average I/O time to fetch a random page from disk?
- 7. Suppose an employee table is stored in 8 pages and these 8 pages are laid out contiguously on disk on the same track. What is the I/O time required to perform a point query on employee if the data is not sorted?
- 8. What is the I/O time required to perform a point query if the data is sorted according to the query condition? (You may assume that only one initial seek is required).