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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 exampes 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).
