1. Scrooge McNugget wants to store information (names, addresses, descriptions of embarrassing moments, etc.) about the many ducks on his payroll. Not surprisingly, the volume of data compels him to buy a database system. To save money, he wants to buy one with the fewest possible features, and he plans to run it as a stand-alone application on his PC clone. Of course, Scrooge does not plan to share his list with anyone. Indicate which of the following DBMS features Scrooge should pay for; in each case, also indicate why Scrooge should (or should not) pay for that feature in the system he buys.
   1. A security facility.
   2. Concurrency control.
   3. Crash recovery.
   4. A view mechanism.
   5. A query language.

2. If your operating system is upgraded to support some new functions on OS files (e.g., the ability to force some sequence of bytes to disk), which layer(s) of the DBMS would you have to rewrite to take advantage of these new functions?

3. A university database contains information about professors (identified by social security number, or SSN) and courses (identified by courseid). Professors teach courses; each of the following situations concerns the Teaches relationship set. For each situation, draw an ER diagram that describes it (assuming no further constraints hold).
   1. Professors can teach the same course in several semesters, and each offering must be recorded.
   2. Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded.
      (Assume this condition applies in all subsequent questions.)
   3. Every professor must teach some course.
   4. Every professor teaches exactly one course (no more, no less).
   5. Every professor teaches exactly one course (no more, no less), and every course must be taught by some professor.