1. \textit{(6 points)} Consider once again our running example of a university database. For each of the statements that follow about this database, circle the SQL feature that would best be used to handle (e.g., enforce) what is described in the statement. If a combination of two SQL features would be needed to do the job, then circle them both.

\textbf{Prof}(pno, pname, salary, age, email) \quad -- \textit{info about Professors}
\textbf{In}(pno, dno, percent) \quad -- \textit{Professors can be In several departments}
\textbf{Dept}(dno, dname, college_id, chair_pno) \quad -- \textit{info about Departments}

(a) The percent time that a professor is in a department must be in the range 0-100.

\textbf{VIEW TRIGGER CHECK FOREIGN NOT NULL CREATE GRANT}
\textbf{constraint key key key not null key procedure}

(b) Every department must have a professor serving as its department chair.

\textbf{VIEW TRIGGER CHECK FOREIGN NOT NULL CREATE GRANT}
\textbf{constraint key key key not null key procedure}

(c) The chair of a department must be in that department at least 50\% of their time.

\textbf{VIEW TRIGGER CHECK FOREIGN NOT NULL CREATE GRANT}
\textbf{constraint key key key not null key procedure}

(d) Howard Gillman should be able to see professor data aggregated by department (number of professors, salary and age statistics) but not individual professors' data.

\textbf{VIEW TRIGGER CHECK FOREIGN NOT NULL CREATE GRANT}
\textbf{constraint key key key not null key procedure}

(e) Peter the Anteater should be able to add new departments but not permitted to execute SQL INSERT statements.

\textbf{VIEW TRIGGER CHECK FOREIGN NOT NULL CREATE GRANT}
\textbf{constraint key key key not null key procedure}

(f) If the professor who is the chair of a department is deleted, the oldest professor who is at least a 50\%-time member of the department should be assigned as its interim chair.

\textbf{VIEW TRIGGER CHECK FOREIGN NOT NULL CREATE GRANT}
\textbf{constraint key key key not null key procedure}

2. \textit{(4 points)} Consider the ISAM index on Prof.age shown on the other side of this quiz.

(a) How many disk reads will be required to locate any professor(s) with age 35?
(b) How many disk reads will be required to locate any professor(s) with age 41?

(c) Draw what this ISAM index will look like after firing the 20-year old professor(s).

(d) Draw what this ISAM index will look like after hiring a new 42-year old professor.