Name1:
Name2:

You are the DB of a large company, with databases that have millions of tuples. You need to improve the performance of your DB.

For the following queries, what indexes will speed up their execution? Assume $R(a, b, c)$, $S(a, d, e)$. S(a) is a FK to R(A).

1. $\Pi_{a,b}R$ None. (In practice index-only plans will help, but we do not cover them).

2. $\Pi_{a,b}\sigma_{b=3}R$ Index on b.

3. $S \bowtie R$ Either table S or table R have an index on a. We cannot use both indexes at the same time.

4. $\sigma_{a>10}R$

A sparse index on a is ideal.
A dense index might be too expensive if #matching tuples is large.