**Cartesian Joins:**

Q: What will be the number of rows in the output of the following query?

A: 35

Q: What will the query SELECT \* FROM table\_one, table\_two; look like?

A:

id

1

2

3

4

10

11

12

**Foreign Keys:**

Q: Based on the above, reconstruct the table schema for employees and departments tables.

A:

SELECT

\*

FROM

employees e

INNER JOIN departments d

ON e.department\_id = d.id

WHERE e.department\_id = 45

;

**Acid:**

Q: What are the ACID properties of SQL transactions? If possible, explain each property with an illustration of an example.

<https://www.ibm.com/support/knowledgecenter/SSGMCP_5.4.0/product-overview/acid.html>

“In the context of transaction processing, the acronym ACID refers to the four key properties of a transaction: atomicity, consistency, isolation, and durability.

Atomicity

All changes to data are performed as if they are a single operation. That is, all the changes are performed, or none of them are.

For example, in an application that transfers funds from one account to another, the atomicity property ensures that, if a debit is made successfully from one account, the corresponding credit is made to the other account.

Consistency

Data is in a consistent state when a transaction starts and when it ends.

For example, in an application that transfers funds from one account to another, the consistency property ensures that the total value of funds in both the accounts is the same at the start and end of each transaction.

Isolation

The intermediate state of a transaction is invisible to other transactions. As a result, transactions that run concurrently appear to be serialized.

For example, in an application that transfers funds from one account to another, the isolation property ensures that another transaction sees the transferred funds in one account or the other, but not in both, nor in neither.

Durability

After a transaction successfully completes, changes to data persist and are not undone, even in the event of a system failure.

For example, in an application that transfers funds from one account to another, the durability property ensures that the changes made to each account will not be reversed.”

**Case:**

Q: Change each animal's species to the correct species.

A:

CASE

WHEN species = ‘duck’ THEN ‘mouse

WHEN species = ‘mouse’ THEN ‘duck

END

**Index:**

Q: Explain an index in SQL.

A: An index is a structure system that is associated with a table and or view that enables the retrieval of data from rows or rows associated with its specific key quickly and efficiently.

Q: What are the different types of index? If possible, explain each type with an illustration.

A: Non-clustered, clustered, XML, Column Store, Full-Text, Unique, Filtered, Hash, Spacial