1. What database models do you know? – **Hierarchical** (tree), **Network**/Graph, **Relational** (table), **Object-oriented**.

2. Which are the main functions performed by a Relational Database Management System (RDBMS)? –

* Creating / altering / deleting tables and relationships between them (database schema)
* Adding, changing, deleting, searching and retrieving of data stored in the tables
* Support for the SQL language
* Transaction management (optional)

3. Define what is "table" in database terms. - Database tables consist of data, arranged in rows and columns. All rows have the same structure. Columns have name and type (number, string, date, image, or other)

The **schema** of a table is an ordered sequence of column specifications (name and type). For example: Persons ( Id: number, FirstName: string, LastName: string, Employer: string ).

4. Explain the difference between a primary and a foreign key. - **Primary key** is a column of the table that uniquely identifies its rows (usually it is a number). The **foreign key** is an identifier of a record located in another table (usually its primary key). Relationships between tables are based on interconnections: primary key / foreign key

5. Explain the different kinds of relationships between tables in relational databases.

* **One-to-many** – e.g. town / addresses - A single record in the first table has many corresponding records in the second table
* **Many-to-many** – e.g. student / course - Records in the first table have many corresponding records in the second one and vice versa. Implemented through additional table.
* **One-to-one** – e.g. example human / student - A single record in a table corresponds to a single record in the other table. Used to model inheritance between tables.

6. When is a certain database schema normalized? What are the advantages of normalized databases? - Normalization of the relational schema removes repeating data

7. What are database integrity constraints and when are they used?

8. Point out the pros and cons of using indexes in a database.

9. What's the main purpose of the SQL language? - SQL (Structured Query Language) - Standardized declarative language for manipulation of relational databases

10. What are transactions used for? Give an example. - Transactions are a sequence of database operations which are executed as a single unit: Either all of them execute successfully OR none of them is executed at all.

EXAMPLE: A bank transfer from one account into another (withdrawal + deposit). If either the withdrawal or the deposit fails the entire operation should be cancelled

11. What is a NoSQL database?

12. Explain the classical non-relational data models.

13. Give few examples of NoSQL databases and their pros and cons.

**Views** are named SQL SELECT queries which are used as tables - Simplify data access; Facilitate writing of complex SQL queries. Used also to apply security restrictions

**Triggers** are special stored procedures that are activated when some event occurs, for instance: When inserting/changing/deleting a record; Triggers can perform additional data processing of the affected rows, e.g. To change the newly added data. To maintain logs and history