Q1.

From the E-R diagram, 7 tables were created. Each id (primary key) in each table is unique. The connection can be seen though the lines. The line that starts and ends with two parallel lines means connection from mandatory one to mandatory one. The line that starts with two parallel lines and ends with many lines means connection from mandatory one to optional many.

- The first table is brands. The primary key is the id of the brand, and the name, address and phone of each brand is also included.
- The second table is models. The primary key is the id of each model and also the name and the year of each model is included. The models table is connected to brands table through brands id.
- The third table is options. It included the id of each option as the primary key and also includes the edition (plus, sport etc) of the car, the colour and the starting price. The option table is connected to models table through model id.
- The fourth table is vehicle. It includes the primary key VIN (id of each car with specific options). The vehicle table is connected to brands table with brand id, to models table with model id and to options table with option id.
- The fifth table is dealers table. It includes the id of the dealers (primary key), the name, phone and address of each dealer.
- The sixth table is customers table. It includes the id of each customer (primary key) and also the name, phone, address and gender.
- The seventh table is orders table. It includes the primary key order id. Also, the order completion (pending or complete) and the order price (the final price that the car sold). The orders table is connected to vehicle table through vin, to customers table through customer id and to dealers table through dealer id.

Q2. The Tables were created as mentioned above and several data values were included in the database.

Q3. I created three indices.

- The first one is the model name of the table models. The reason is that many times the user may want to find information of a specific model to show to the customer.
- The second index is the order completion from table orders as status. The reason is that the user needs to see the order status for example for pending orders.
- The last index is the customer's name from customers table. The reason is the user may want to find a specific name of customer to find more information about him.

Also, I include three SELECT statements. The first one shows the brand and model name along with specific options for each model. In this statement, the first index may be useful for a search.

The second and third statement includes each order and the specific information of the car that was sold. In second statement, the third index may be useful for a search. In the third statement, I use the second index to show only the pending orders.

Q4. The menu that was created through python includes the following:

Code to connect to the database

Code to create each class

Code to create the columns of each class

Code to create the menu based on the steps that were described in question 4.

Choose between 3 options:

- Option 1: entity management (select an entity-select insert, delete or update for this entity)
- Option 2: entity search (select an entity-select a field-select a value to search)
- Option 3: perform a specific query