SQL: Data Manipulation (3 points each)

(1) *What are the two major components of SQL and what function do they serve?*

(2) *Explain the function of each of the clauses in the SELECT statement. What restrictions are imposed on these clauses?*

(3) *Explain how the GROUP BY clause works.*

**Note:** Use the following tables, which form part of a database held in a relational DBMS, for questions (4) through (25):

<table>
<thead>
<tr>
<th>Table</th>
<th>Columns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel</td>
<td>(hotelNo, hotelName, city)</td>
</tr>
<tr>
<td>Room</td>
<td>(roomNo, hotelNo, type, price)</td>
</tr>
<tr>
<td>Booking</td>
<td>(hotelNo, guestNo, dateFrom, dateTo, roomNo)</td>
</tr>
<tr>
<td>Guest</td>
<td>(guestNo, guestName, guestAddress)</td>
</tr>
</tbody>
</table>

where Hotel contains hotel details and hotelNo is the primary key;

Room contains room details for each hotel and (roomNo, hotelNo) forms the primary key;

Booking contains details of the bookings and (hotelNo, guestNo, dateFrom) forms the primary key;

and Guest contains guest details and guestNo is the primary key.

**Hint:** You may want to create the tables and populate them with sample data (based on the question being asked) to check your work.

**Simple Queries (3 points each)**

(4) *List full details of all hotels.*
(5) List full details of all hotels in London.

(6) List the names and addresses of all guests in London, alphabetically ordered by name.

(7) List all double or family rooms with a price below £40.00 per night, in ascending order of price.

(8) List the bookings for which no dateTo has been specified.

Aggregate Functions (2 points each)

(9) How many hotels are there?

(10) What is the average price of a room?

(11) What is the total revenue per night from all double rooms?

(12) How many different guests have made bookings for August?

Subqueries and Joins (3 points each)

(13) List the price and type of all rooms at the Grosvenor Hotel.

(14) List all guests currently staying at the Grosvenor Hotel.

(15) List the details of all rooms at the Grosvenor Hotel, including the name of the guest staying in the room, if the room is occupied.
(16) What is the total income from bookings for the Grosvenor Hotel today?

(17) List the rooms that are currently unoccupied at the Grosvenor Hotel.

(18) What is the lost income from unoccupied rooms at the Grosvenor Hotel?

Grouping (3 points each)

(19) List the number of rooms in each hotel.

(20) List the number of rooms in each hotel in London.

(21) What is the average number of bookings for each hotel in August (hint: think hash join/inline view)?

(22) What is the most commonly booked room type for each hotel in London?

(23) What is the lost income from unoccupied rooms at each hotel today?

Populating Tables (3 points each)

(24) Insert records into each of these tables: Hotel, Room, Guest, and Booking.

(25) Update the price of all rooms by 5%.
SQL for Data Warehousing (Points assigned to each question)

(26)  *Explain the various types of subqueries in Oracle, give examples of each type.*  (5 points)

(27)  *Explain how an external table in Oracle works. Under what conditions might an external table be used?*  (5 points)

(28)  *Explain the function of each of the clauses in the Oracle MERGE statement.*  (5 points)

(29)  *Explain how the Oracle CASE expression works. Given an example.*  (5 points)

(30)  *Explain the difference between a sort-merge join and a hash join (inline view). Give an example of a query that uses an inline view (hash join).*  (5 points)