ITM
IT MUSTAKBIL

Final Examination

Full Name:

Roll No: **Section:**

Introduction to Database Systems **2 hours**

Database Design & SQL Queries Semester 2

Theory & Practical Fall (2022)

Instructions:

- You must answer **all** questions. There are **no optional** questions.
- You are responsible for ensuring your answers are clear and unambiguous.
- All **submissions** must be **uploaded** using the attached **Google Form** in the **exam link**.
- You must **insert snips** of all **query outputs** in the **space under each question**.
- Write your full name, roll number and section in the boxes at the top of the page.
- **You may use any online / offline notes, handouts, notes or resources except help taken from other students of ITM and their work.**
- This exam affords **zero tolerance** to students found using dishonest or unfair means.

Information:

- The total marks for this paper are 50.
- The number of marks for each question or part question are shown in brackets [ ].
- Students may only be awarded whole number marks.
- There are a total of 4 pages and 1 blank page in this paper.
- There are **two sections** in this paper; A) SQL Queries, B) Database Design.

Total Marks
/ 50

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Section A

SQL Queries

About the Database

Overview:

The 'classicmodels' database is a collection of records collected by a retailer of scale models of classic cars. It contains typical business data such as customers, products, sales orders, sales order line items, etc.

Table Descriptions:

Table Identifier	Description
Customers	Stores customer's data.
Products	Stores a list of scale model cars.
ProductLines	Stores a list of product line categories.
Orders	Stores sales orders placed by customers.
OrderDetails	Stores sales order line items for each sales order.
Payments	Stores payments made by customers based on their accounts.
Employees	Stores all employee information as well as the organization structure such as who reports to whom.
Offices	Stores sales offices data.

Database Schema:

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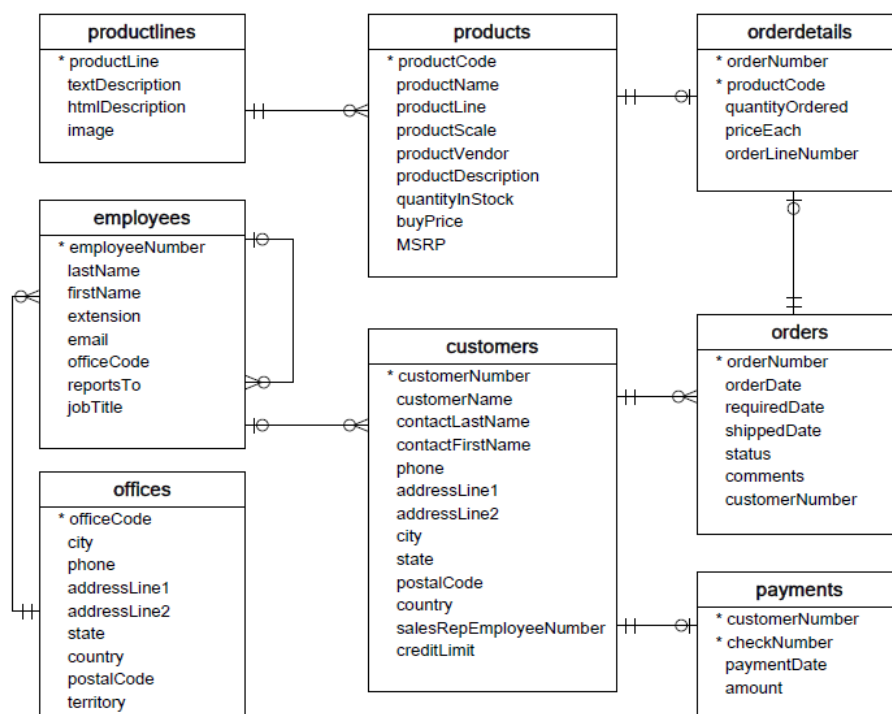
Part 1: Single Table Simple Queries

Write one or more SQL queries to solve each of the following problems:

1 Display the first 5 tuples of each table. **[1]**

2 Display the employee head count of the company. **[1]**

3 Display the primary key fields only for each table. **[1]**

4 Display all products that are out of stock. **[1]**

5 Display the total number of classic car models currently in stock. **[1]**

6 Display the employee number, first name and last name of all sales managers. **[1]**

7 Display all Mercedes based models. **[1]**

8 Change the job title of employee number 1002 from President to CEO. **[1]**

9 Display all orders that were shipped after the customer's requirement date. **[1]**

10 Display all the orders that were cancelled before getting shipped. **[1]**

Part 2: Single Table Grouping, Aggregation & Derived Attributes

Write one or more SQL queries to solve each of the following problems:

11 Display total number of customers handled by each sales representative. **[1]**

12 Display the country with the least number of customers. **[2]**

13 Display the total number of products in each product line, along with the min, max and average manufacturer suggested retail price (MSRP) of products in the product line. **[2]**

14 Display all order IDs containing at least 15 products sorted in decreasing order of ordered product count. **[2]**

15 Display single order ID which generated the greatest revenue income. **[3]**

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Part 3: Joined Tables & Complex Queries

Write one or more SQL queries to solve each of the following problems:

16 Display the employee number, first name, last name and the country where each employee works. **[2]**

17 Display the product code, product name and slogan (text description) for each product. **[2]**

18 Find the average profit earned from products supplied by each vendor, sorted in descending order. **[3]**

19 Display the employee number, first name and last name of the sales representative that had the greatest number of cancelled orders. **[3]**

20 Display the first name and last name of each employee, along with the first name and last name of their boss. Display 'NULL' if boss does not exist. **[5]**

21 Find all customers that are being served by sales representatives stationed out of the customer's local country. Display the customer's name, the customer's country, as well as the country from which they are being served. **[5]**

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Section B

Database Design

22 Design a normalized relational schema to store the data and information in
the attached 'Consumer Complaints Flat File.csv'.

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