# Worksheet 2 Database concepts

**Section A – Practical Work**

In order to see how databases work we are going to explore SQL using a website: <https://sqlfiddle.com/>

### Click on the link for MySQL

### Task 1 – Creating Tables

Someone else may have created a Product table. First we need to drop any such table as follows:

DROP TABLE IF EXISTS Product;

Then use the CREATE TABLE keywords to create a product table for the sample database as follows:

CREATE TABLE tblProducts

(

ProductID CHAR(3) NOT NULL PRIMARY KEY,

Name VARCHAR(20) NOT NULL,

Subject VARCHAR (255),

Level int,

Price DECIMAL(10,2)

);

Here we defined ProductID as the primary key. Copy this into the workspace.

You can now create the other two tables tblCustomer and tblSubscription using the slides to help you. Make sure you decide on the Primary Key for each table and the data types. These will be similar to the above definition.

Make your subscription id an integer which is automatically generated using int and AUTO\_INCREMENT.

In an exam you can use the data type CURRENCY but in this version of SQL you will need DECIMAL(10,2). 10 is the number of digitals and 2 is the number of decimal places.

You should now have three table definitions in your worksapce. Click “Run It” to check you haven’t made any mistakes there should be no errors.

### Task 2 – Adding Data

Add the data as shown in the slides so that you database schema is complete. You will need the following statement. Make sure you have the “;” at the end of each line:

INSERT INTO tblProducts VALUES ("P24", "Equations", "Maths", 2, 12.00);

**Dates**

To insert a date you will should use the date format “yymmdd” in inverted commas. So “14-04-2007” would be inserted as “20170414”. Different versions of SQL handle this differently so you will need to find a reference manual, but this is common to most. In the exam you can just write “#14-04-2007#”

**Validation**

In order to check the validation rules try adding a product whose id is too long e.g. P345. You should get an error

### Task 3 – Retrieving Data

You can now try retrieving data from your dataset. Use

SELECT \* FROM tblCustomer;

to get a list of all customers. We will look at more complex SELECT queries later.

CREATE TABLE tblCustomer(

custID CHAR(4),

title VARCHAR(20),

firstName VARCHAR(40),

surName VARCHAR(40),

email VARCHAR(80)

);

INSERT INTO tblCustomer(custID, title, firstName, surName, email) VALUES('C111','Mr','Fred','Carr','fcarr53@gmail.com');

INSERT INTO tblCustomer(custID, title, firstName, surName, email) VALUES('C245','Miss','Mabel','Jenkins','mabel777@bt.com');

INSERT INTO tblCustomer(custID, title, firstName, surName, email) VALUES('C364','Miss','Jasmine','Kumar','jkumar@icloud.com');

SELECT \* FROM tblCustomer;

SELECT \* FROM tblCustomer WHERE title = 'Miss';

**CREATE TABLE tblSubscription (**

**subID INT AUTO\_INCREMENT KEY,**

**startDate DATE,**

**endDate DATE,**

**custID CHAR(4),**

**productID CHAR(3)**

**);**

**INSERT INTO tblSubscription(startDate, endDate, custID, productID) VALUES('20160225','20170224','C111','P36');**

**INSERT INTO tblSubscription(startDate, endDate, custID, productID) VALUES('20160201','20170131','C111','P47');**

**INSERT INTO tblSubscription(startDate, endDate, custID, productID) VALUES('20160204','20170203','C245','P36');**

**SELECT \* FROM tblSubscription;**

**Section B – Theory Questions**

**Task 5: Entity relationship diagrams**

# 1. What is an entity in the context of databases?

A category of object, person, event, etc, a category of a thing

# 2. The relationship between two entities may be one of three types, or degrees.

# What are the three degrees of relationship between entities?

# One to one

One to many

Many to one

# 3. Draw entity relationship diagrams for each of the following pairs of related entities:

(a) Dentist and patient

One to many

(b) Student and teacher

Many to one

(c) UK citizen and UK Passport

Many to one

(d) Product and component

Many to many

4. A company makes a range of kitchen utensils which they sell online. They record details of their customers, products and orders received in a database. An order may be for several products.

Complete the E-R diagram to show all the relationships between all the entities.

Customer

Product

Order

OrderLine



5. Complete the design of the order form shown below. Enter some data for a sample order for **three** different products.

Line Qty Product code Description Unit price Total price

1 1 1 shampoo £5 £5

2 1 2 coffeebeans £2 £2

3 5 4 keyboards £40 £160

Total :£167

KitchenTools Ltd

(address)

Order number: 1

Date: 2025/01/22

(Customer details)

CustomerID

Name

Surname

Address

Email

On your order form, what are the primary key fields of the entities Customer, Product, Order, OrderLine?

For customer its customerID, for product its producecode, for order its order number, for orderline its line.