# Assessment test

1. A company selling books online keeps a record of customers, products and the orders that customers make online. An order may be for several different books.

 A new database system is to be created to hold this data. The following tables are suggested. (Not all fields are shown for each table)

 Customer (CustomerID, Surname, Email)

 Book (BookID, Title, QtyInStock)

 Order (Order Number, Order Date, CustomerID, BookID, Quantity)

 (a) Define what is meant by **a primary key**. [1]

 (b) The database designer has identified a problem with the tables as they stand, and amends the tables so that the order table should be split into two tables:

 Order (Order Number, Order Date, CustomerID)

 OrderLine (Order Number, BookID, Quantity)

 Explain why this change is necessary. [2]

 (c) Explain what is meant by a **foreign key**. Identify two foreign keys in one of the tables in the amended database. [3]

 (d) What is a **composite key**? Identify a composite key in one of the tables in the amended database. [2]

 (e) Complete the following entity relationship diagram to show the degree of any **four** relationships that exist between the entities. [4]

OrderLine

Order

Customer

Book

2. An insurance company keeps details about vehicles that it insures, policy holders and insurance policies.

 The details are held in a relational database using the following relations. (Not all fields are shown)

 **Vehicle**

 RegistrationNo VARCHAR (8)

 Make VARCHAR (12)

 Model VARCHAR (15)

 Colour VARCHAR (12)

 DateRegistered DATE (dd/mm/yy)

 **Policy**

PolicyNumber CHAR (8)

 ExpiryDate DATE (dd/mm/yy)

 ExcessAmount Currency (integer, e.g. 500)

 **Owner**

 OwnerID CHAR (6)

 Firstname VARCHAR (15)

 Surname VARCHAR (20)

 DateOfBirth DATE (dd/mm/yy)

 Address VARCHAR (30)

Postcode VARCHAR (10)

 Some policy holders may have several vehicles insured. Each vehicle has a unique insurance policy.

 (a) Write the three relations in the format

 TableName (attribute1, attribute 2, ….)

 Show how the tables will be related using foreign keys.

 Underline the primary key of each table, and identify any foreign keys with an overbar.

 e.g. $\overline{foreignkey}$ [6]

 (b) Complete the entity relationship diagram below showing the degree of the
relationships between the entities. [3]

Vehicle

Policy

Owner

 (c) Write SQL statements to extract the following data:

 (i) the registration number, make, model and date registered of all vehicles with dateRegistered before 2015, displayed in order of date registered [4]

 (ii) The Policy number, registration number and make of all cars with an ExcessAmount of 500 or more in descending order of ExcessAmount. [5]

 (d) Write SQL statements to do the following:

 (i) Create a new table for Claims, which has the following fields:

 ClaimID CHAR (6) Primary key

 ClaimDate DATE (dd/mm/yy)

 PolicyNumber Char (8) (Foreign key, link to Policy relation) [6]

 (ii) Update the record for the vehicle with registration number FG16 JUR, in which the model name was wrongly recorded. It should be “Golf Mk6”. [3]

 (iii) Insert a new record into the OWNER table with the following field values: [2]

 OwnerID 123456

 Firstname Jess

 Surname Kotton

 DateOfBirth 01/03/1990

 Address 56 Sloane Street

 Postcode IP4 9MN

3. (a) Give **three** advantages of a client-server database. [3]

 (b) Describe a potential problem that can arise with a client-server database. [2]

 (c) Name and briefly describe **two** methods of overcoming the problem. [4]

 [Total 50 Marks]