



Databases

SAMPLE TIME CONSTRAINED ASSESSMENT

Answer ALL questions.

Clearly cross out surplus answers.

Time: 4 hours

The maximum mark for this paper is 100.

Any reference material brought into the examination room must be handed to the invigilator before the start of the examination.

Answer ALL questions

Question 1

- a) Explain TWO (2) functions of a DBMS, with an example and why this is important. 4
- b) Identify FOUR (4) types of records/entities a car sales showroom might store data about. 4
- c) If an ERD has a many-to-many relationship describe what could be done to fix it. 2

Total 10 Marks

Question 2

- a) The following table is in *Third Normal Form (3NF)*. Suggest appropriate data types and keys (if applicable) for the attributes listed. 6

Attribute Name	Data Type	Key
ServiceID	Number (Auto increment)	Primary Key
CustomerID		
CarRegNo		
ServiceDate		
StaffID		

- b) Identify TWO (2) properties of a *Candidate key*. 2
- c) Explain the term *Optionality (in the context of an ERD)* and provide a suitable example. 2

Total 10 Marks

Question 3

Consider the following scenario shown below:

A college student studies a number of modules and is issued with a transcript of results at the end of the year.

- a) Draw an *Entity-Relationship (ER) diagram* to represent the above scenario. 5
- b) Identify all of the primary **and** foreign keys for the ER model in question 3 a). 5

Total 10 Marks

Question 4

- a) Consider the ER diagram shown below for a Doctor’s surgery system through which patients can book appointments with a Doctor. 6



- i) Create a CRUD matrix to show the following transactions:

- Transaction 1 – add a new appointment for an existing patient
- Transaction 2 – delete a Doctor
- Transaction 3 – update a Patient’s details
- Transaction 4 – change the time of an appointment
- Transaction 5 – produce a list of all appointments including Doctor & Patient details
- Transaction 6 – add a new patient

- b) Identify the CRUD operations in a transaction. 4

Total 10 Marks

Question 5

- a) What does the acronym *SQL* stand for? 1
- b) Explain and summarise the purpose of *SQL*. 2

Questions continue on the next page

c) Consider the following tables:

tblAnimal

AnimalID	AnimalName	DOB	Type
117	Leo	12/2/2017	Lion
218	Keeno	12/3/2015	Tiger
342	Darli	9/1/2012	Gorilla
912	Lou-Lou	18/7/2014	Elephant
1116	Doogle	25/4/2016	Elephant
1187	Prince	19/10/2015	Lion

tblKeeper

KeeperID	KeeperName
1	Cecil Armstrong
2	Miranda Narzala
3	Derek Longbottom
4	Hermoine Garnett

tblAnimalKeeper

KeeperID	AnimalID
1	117
1	1187
2	912
2	1116
3	218
4	342

- i) Write the SQL that produces a list of the animals, type and date of birth in date order. 2
- d) Write the SQL that lists only the names and dates of birth of the lions. 2
- e) Write the SQL that produces a list of all of the animal names, their type and their keeper names. 3

Total 10 Marks

Question 6

a) Consider the following table:

tblFood

FoodID	Description	Cost	Type
3	Chocolate Doughnut	£1.12	Sweet
4	Meat Pie	£0.89	Pies
5	Cheese Pie	£1.02	Pies
6	Danish Pastry	£1.05	Sweet

i) Write the SQL statement that will update the **Pies** type to **Savoury**.

3

b) Consider the following table:

tblItems

ItemID	ItemDescription	Type	Price
3	White 6 Seat Dining Table	Table	£399.95
4	Small Oak Coffee Table	Table	£129.99
5	Small Children Wardrobe Pine	Bedroom	£124.99
6	Toddler Bed White	Bedroom	£89.99

i) Write the SQL statement that will delete all of the data held for items where the price is over £300.

2

c) Consider the following table:

tblCar

CarID	Manufacturer	Model	Price
1	Quintec	CityXP	£12,800
2	Smord	Sprint	£15,750
3	Nisax	Family	£21,995

i) Write the SQL statement that will create the table **and** add the data into the newly created table.

5

Total 10 Marks

Question 7

Woof Cuts is a grooming salon for dogs. It has several groomers. The customer contacts the salon to make an appointment for their dog. The customer contact details are recorded on the system together with the name and breed of the dog (so that it can be determined if the dog is a small / medium or large breed – and can be charged accordingly). An appointment is made for the dog at an agreed date and time and a member of staff is assigned to that appointment. Special comments are noted on the appointment (e.g. Dog must be muzzled etc.)

A suggested ER model is below:



- a) Replicate the *data dictionary* below for each one of the entities. **20**

Using the information provided above, populate it with a range of suitable attributes and associated meta data for each entity.

NB: For clarity it is expected that there will be multiple entries for each entity.

tblCustomer

AttributeName	Data Type	Length/Field Size	Key

tblAppointment

AttributeName	Data Type	Length/Field Size	Key

tblStaff

AttributeName	Data Type	Length/Field Size	Key

Total 20 Marks

Question 8

- a) Explain the purpose of normalisation 2
- b) What conditions need to be met if a table is said to be in second normal form (2NF) 3
- c) The following table is in first normal form (1NF). Normalise it to second normal form. 5

Students		
FirstName	Surname	Subject
Adam	George	Art and Design
Melissa	Brown	Art and Design
Shabana	Atif	Maths
Louise	Jenkins	Maths

Total 10 Marks

Question 9

- a) Explain each of the following DBMS terms. 5
 - i) *Tuple*
 - ii) *Attribute*
 - iii) *Data type*
 - iv) *Optionality*
 - v) *Cardinality*
- b) Explain the term *referential integrity* and provide an example. 5

Total 10 Marks

End of paper