9 Databases
QUESTIONS

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1	Define a single-table database from given data storage requirements			
2	Suggest suitable basic data types			
3	Understand the purpose of a primary key and identify a suitable primary key for a given database table			
4	Read, understand and complete structured query language (SQL) scripts to query data stored in a single database table			

More Guidance:

Candidates should be able to:	Notes and guidance
1 Define a single-table database from given data storage requirements	• Including: – fields – records – validation
2 Suggest suitable basic data types	• Including: – text/alphanumeric – character – Boolean – integer – real – date/time
3 Understand the purpose of a primary key and identify a suitable primary key for a given database table	
4 Read, understand and complete structured query language (SQL) scripts to query data stored in a single database table	• Limited to: – `SELECT` – `FROM` – `WHERE` – `ORDER BY` – `SUM` – `COUNT` • Identifying the output given by an SQL statement that will query the given contents of a database table

9 A model shop wants to set up a database to help with stock control of the model figures available for sale. The shop wants to store this information about the model figures:
Field 1 – catalogue number, for example MD1234
Field 2 – description, for example 'small white dog'
Field 3 – number in stock, for example 5
Field 4 – the price of each model, for example 7.40
Field 5 – if the model has already been painted, yes or no.

(a) The shop needs **five** fields for each record.
Give a suitable name and data type for each field.

Field 1 name .....

Data type .....

Field 2 name .....

Data type .....

Field 3 name .....

Data type .....

Field 4 name .....

Data type .....

Field 5 name .....

Data type .....
[5]

(b) **(i)** Give the name of the field that should be used for the primary key.

..... [1]

(ii) State why this field is used as the primary key.

..... [1]

(c) Structured query language (SQL) is used to query data stored in this database.
State what these SQL commands are used for.

`SELECT` .....

.....

`FROM` .....

.....

`WHERE` .....

.....
[3]

10 A database table called `Horses` stores details about the horses kept at a horse sanctuary.

Code	Breed	BreedOrigin	Gender	Age	Arrived
H002	Arabian	Saudi Arabia	M	5	28/09/2022
H004	Percheron	France	M	5	30/10/2022
H010	Friesian	Netherlands	M	6	15/11/2022
H011	Fjord	Norway	F	4	17/11/2022
H012	Clydesdale	Scotland	M	10	18/11/2022
H015	Arabian	Saudi Arabia	F	5	15/12/2022
H016	Arabian	Saudi Arabia	F	5	15/12/2022
H017	Clydesdale	Scotland	F	4	16/01/2023
H019	Percheron	France	M	3	16/01/2023
H025	Percheron	France	M	7	16/01/2023
H026	Clydesdale	Scotland	F	9	20/01/2023
H030	Clydesdale	Scotland	M	12	20/01/2023
H032	Fjord	Norway	M	3	24/03/2023
H033	Arabian	Saudi Arabia	F	15	27/04/2023
H034	Clydesdale	Scotland	F	4	14/06/2023
H035	Fjord	Norway	M	7	15/06/2023
H036	Friesian	Netherlands	F	15	20/07/2023
H037	Friesian	Netherlands	M	12	20/07/2023

(a) State the number of records in this database table.

..... [1]

(b) Give the name of the field that is most suitable to be the primary key.

State the reason for this choice.

Field .....

Reason .....

.....

[2]

(c) The database only allows the data types:

- Boolean
- character
- date/time
- integer
- real
- text.

Complete the table to show the most appropriate data type for each field.
Each data type must be different.

Field	Data type
`Breed`	
`Gender`	
`Age`	
`Arrived`	

[2]

(d) Complete the structured query language (SQL) to return the code and breed of all the horses whose breed originated in Scotland.

```
..... Code, Breed,

FROM .....

WHERE ..... = "Scotland";
```

[3]

9 A sanctuary for pheasants has set up a new database table called `PheasantList` to store details of the different species of bird at the sanctuary. Part of this table is given, showing: species, description, number of birds at the sanctuary, if the birds are breeding or **not**, and number of young born this year.

Species	Description	NumberBirds	Breeding	Young
Edwards	blue-black with white tail	5	Yes	0
Japanese green	dark green with pale grey tail	2	Yes	2
Reeves	golden, white and red scaled plumage	4	Yes	1
Crawfords Kalij	glossy blue-black plumage	4	No	0
Crested fireback	blue-black with black tail	3	No	0
True silver	white laced top half and black lower half	7	Yes	1
Siamese fireback	grey plumage with crimson legs and feet	5	No	0
Mikado	iridescent plumage with white striped wings	3	Yes	4
Red junglefowl	many colours	2	Yes	0
Himalayan monal	many colours with metallic green crest	3	Yes	2
White eared	white with ear tufts	5	Yes	3
Brown eared	brown with ear tufts	9	Yes	1
Ring necked	long tail with white ring neck	2	Yes	2
Golden	rainbow coloured	3	Yes	4

(a) State the number of records and fields in this part of the database table.

Records .....

Fields .....

[2]

(b) **(i)** Give the name of a field that could be used for the primary key.

..... [1]

(ii) Explain why the sanctuary might decide **not** to use the field in **(b)(i)** as the primary key.

.....

..... [1]

(iii) A new field `SpeciesID` is added to the database table.
This field contains a six-character code, for example Ph0001.

Give a reason why this field would be a better primary key.

.....

..... [1]

(c) Write the output that would be given by this structured query language (SQL) statement:

```
SELECT Species, Description

FROM PheasantList

WHERE NumberBirds > 6;
```

.....

..... [2]

(d) Complete this SQL statement to display all the species of pheasant where the birds are breeding and there were no young born this year:

```
SELECT .....

FROM .....

WHERE .....

..... ;
```

[4]

10 A database table called `TVRange` shows the main features and prices of a range of televisions.

TVCode	ScreenSize	Satellite	SmartTV	SoundBar	Price$
TV90SaSmSd	90	YES	YES	YES	9750.00
TV75SaSmSd	75	YES	YES	YES	8500.00
TV75SaSd	75	YES	NO	YES	8000.00
TV65SaSmSd	65	YES	YES	YES	6000.00
TV65SmSd	65	NO	YES	YES	5000.00
TV65SaSd	65	YES	NO	YES	5000.00
TV55SaSmSd	55	YES	YES	YES	4000.00
TV55SaSd	55	YES	NO	YES	3500.00
TV55SmSd	55	NO	YES	YES	3500.00
TV50SaSmSd	50	YES	YES	YES	2500.00
TV50Sa	50	YES	NO	NO	1750.00
TV50Sm	50	NO	YES	NO	1750.00
TV40Sa	40	YES	NO	NO	1200.00
TV40	40	NO	NO	NO	950.00
TV32	32	NO	NO	NO	650.00

(a) Give the name of the field that is most suitable to be the primary key.

State the reason for this choice.

Field .....

Reason .....

.....

[2]

(b) The database uses the data types:

- text
- character
- Boolean
- integer
- real
- date/time.

Complete the table to show the most appropriate data type for each field.
Each data type must be different.

Field	Data type
TVCode	
ScreenSize	
SmartTV	
Price$	

[2]

(c) Complete the structured query language (SQL) query to return the television (TV) code, screen size and price of all Smart TVs in the database table.

```
SELECT TVCode, ....., .....

..... TVRange

WHERE SmartTV = .....;
```

[4]

10 A music streaming service has a new database table named `Songs` to store details of songs available for streaming. The table contains the fields:

- `SongNumber` – the catalogue number, for example AG123
- `Title` – the title of the song
- `Author` – the name of the song writer(s)
- `Singer` – the name of the singer(s)
- `Genre` – the type of music, for example rock
- `Minutes` – the length of the song in minutes, for example 3.75
- `Recorded` – the date the song was recorded.

(a) Identify the field that will be the most appropriate primary key for this table.

..... [1]

(b) Complete the table to identify the most appropriate data type for the fields in `Songs`

Field	Data type
`SongNumber`	
`Title`	
`Recorded`	
`Minutes`	

[2]

(c) Explain the purpose of the structured query language (SQL) statements.

```
SUM (Minutes) FROM Songs WHERE Genre = "rock";

COUNT (Title) FROM Songs WHERE Genre = "rock";
```

.....

.....

.....

.....

.....

..... [3]

10 A database table called `Site1` stores details of some holiday homes at a holiday park. The database shows the type of home, number of guests, whether it is privately owned and the weekly rate to hire it.

Name	Type	Private	Rate$	NumberGuest
Bay Lodge	Lodge	NO	1000	10
Bay View	Cabin	NO	400	4
Blue Skies	Cabin	NO	350	4
Cliff View	Cabin	NO	650	6
Coppice Lodge	Lodge	NO	1200	12
Green Lodge	Lodge	NO	1000	8
Henry	Cabin	YES	300	2
Hikers' Rest	Retreat	NO	750	6
Poppy	Cabin	NO	300	2
Summer Joy	Retreat	YES	750	6
Valley View	Cabin	NO	600	6
West Lodge	Lodge	YES	1200	12

(a) State the number of fields and the number of records in this database table.

Fields .....

Records .....
[2]

(b) Describe the purpose of a primary key.

.....

..... [1]

(c) The database uses the data types:

- alphanumeric
- character
- Boolean
- integer
- real
- date/time.

Complete the table to show the most appropriate data type for each field.

Field	Data type
`Type`	
`Private`	
`Rate$`	
`NumberGuest`	

[2]

(d) Give the output that would be produced by the structured query language (SQL) statement:

```
SELECT Name, NumberGuest, Rate$
FROM Site1
WHERE NumberGuest >= 10;
```

.....

.....

.....

.....

.....

..... [3]

9 Databases
QUESTIONS

9 A shop that sells books has set up a new database table called `BookList` to store book details. Part of this table is given.

CatNo	Title	Fiction	Author	PaperBack	Price	StockLevel
BK01	The Princes' Story	Yes	B Penn	Yes	4.50	500
BK02	The Princesses' Story	Yes	B Penn	Yes	4.50	350
BK03	Computer Science	No	Way Yu	Yes	19.99	20
BK04	The Modern World	No	P Patel	No	25.00	5
BK05	The Ancient World	Yes	P Patel	No	25.00	5
BK06	Computer Science	No	R Dale	Yes	27.35	8
BK07	The Princes' Story	Yes	B Penn	No	12.50	3
BK08	The Princesses' Story	Yes	B Penn	No	12.50	0
BK12	Famous Five	Yes	E Bly	Yes	2.75	45
BK15	Secret Seven	Yes	E Bly	Yes	2.75	25
BK16	The Last Knight	Yes	P Mann	Yes	5.99	7
BK17	The Dark Tower	Yes	P Mann	Yes	5.99	5
BK19	The Final Chase	Yes	P Mann	Yes	5.99	5
BK21	Maths Today Part 1	No	B Ward	Yes	6.75	25
BK22	Maths Today Part 2	No	B Ward	Yes	6.75	15
BK23	Maths Today Part 3	No	B Ward	Yes	6.75	10
BK26	Maths Today Workbook	No	B Ward	Yes	6.75	30
BK27	Knitting for Beginners	No	A Smith	Yes	6.99	3
BK30	Woodwork for Beginners	No	A Smith	Yes	6.99	4
BK31	Networking for Beginners	No	A Smith	Yes	6.99	0

(a) State the number of records in this part of the database table.

..... [1]

(b) **(i)** Give the name of the field that would be used for the primary key.

..... [1]

(ii) State the reason for choosing this field for the primary key.

.....

..... [1]

(c) Complete the table to identify the most appropriate data type for each field based on the data shown in the table `BookList`

Field	Data type
`CatNo`	
`Title`	
`Fiction`	
`Price`	

[2]

(d) Write the output from this structured query language (SQL) statement.

```
SELECT CatNo, Title, Author

FROM BookList

WHERE StockLevel = 0;
```

.....

.....

.....

..... [2]

(e) Complete this SQL statement to display all the titles by the author B Penn.

```
SELECT .....

FROM .....

WHERE .....;
```

[2]